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ORIGINAL COMMUNICATIONS.

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I.

AN ESSAY *on the Nature and Cause of the* MALIGNANT PLEURISY, *which proved so remarkably fatal to the inhabitants of Huntington, and some other places on Long Island, in the winter of the year 1749. Drawn up at the request of a weekly society of gentlemen in New-York, and addressed to them at one of their meetings, January, 1749. By the late Dr. JOHN BARD.\**

GENTLEMEN,

OF all the objects of physical knowledge, there are none more amazing, or that afford a more useful speculation, than the history of epidemical diseases; a right

\* Believing a copy of this essay of Dr. J. Bard to be in the possession of some of his friends, we, in a former number of the Register, expressed a wish to obtain the manuscript of it for publication. Through the polite attention of Dr. David Craig, a pupil of the author, and now a practitioner of medicine in Rahway, New-Jersey, we lately received an entire copy of the essay; besides two other original letters on philosophical subjects, by Dr. J. Bard and Lieutenant Governor Cadwallader Colden.

EDITORS.

knowledge of these is of the utmost importance to the improvement of the medical art, and, consequently, to the benefit of mankind.

By epidemical diseases are meant general or spreading disorders, attacking great numbers within the circle of its appearance, at or near the same time, proceeding from a contagious affection of the air, and sometimes propagated by contagion received from one by another person unaffected; of this kind is the disorder now prevailing on Long-Island, the subject of our present examination.

That we may proceed on this inquiry in a regular and intelligible manner, I shall beg leave to premise a few maxims relating to the nature of epidemical diseases in general, first discovered, or at least received in Europe by the incomparable Sydenham, and since established by the authority of the learned and industrious Boerhaave, and clearly evident to every diligent observer engaged in the practice.

First, then, the remote causes of these disorders are entirely inscrutable by us, and the attempting to account for all their phenomena from the sensible qualities of the air, or particular systems of philosophy, is altogether vain and fruitless: their sensible appearances, however, are reducible to fixed and certain laws, considered either with regard to the relation they bear to one another, the regular rise, progress, height and declension of a whole epidemical constitution, of one particular season, a year or years; or the rise, progress, height and declension of the symptoms which make up the history of any particular disease; their tendency at the vernal or autumnal equinoxes,



(at which seasons they are generally most prevalent,) and many other particulars which experience and observation have established as unquestionable maxims.

These inquiries, formed upon a just knowledge of the animal economy and the history of diseases, the assistance of Dr. Harvey's discovery of the circulation of the blood, unknown to the ancients, together with other improvements which had at that time been made in physical learning, engaged the indefatigable application of this great and sagacious man, particularly for the last fifteen years of his life ; in which time he compiled a most accurate and complete history of the acute and epidemical diseases, which prevailed in his time and country, and has communicated his observations to the world with the utmost faithfulness and candour.

The epidemical fevers which prevailed in the city of London, during his observation and practice, he distinguishes into what he calls stationary and intercurrent, the intercurrents he again divides into essential and symptomatical. By a stationary fever he means a regular, simple, stated epidemical fever, arising not from any of the sensible qualities of the air, or an error in the non-naturals, (he having observed that years perfectly agreeing as to the manifest temperature of the air, have nevertheless produced very different tribes of diseases, and vice versa,)\*

\* The variety of symptoms observable in epidemical distempers are so obscure, that physicians have not been able to deduce them from any abuse of the non-naturals, and yet there are many circumstances which make it highly probable that their causes reside in the air, but depend more upon the inexplicable variety of exhalations contained therein, which by their mixture with the fluids of the hu-

but from a general constitution of years, which owes its origin to a certain secret inexplicable alteration in the bowels of the earth, whence the air becomes impregnated with such kind of effluvia as subjects the human body to particular distempers, so long as that kind of constitution prevails, and which, after a certain course of years, (for it often continues several years,) declines and gives way to another.

Each of these general constitutions is attended with its own proper and peculiar kind of fever, which never appears in any other ; and during each of these general constitutions,\* this primary or stationary fever presides over the rest, or all the other species of epidemics are in a peculiar manner affected thereby. The other species are called intercurrents, and seem to depend much upon the sensible qualities of the air, and other particular accidents. These fevers take place indifferently in all years, and in particular seasons of the same year ; of this kind are the scarlet fever, quinsy, pleurisy, and the like.

There are (besides these two species of epidemics, viz. stationary and essential intercurrents) a third species,

man body, or their stimulus, injure the human machine more than any change in the sensible qualities thereof.

*Boerhaave's Aphorisms, 1412-13-14. No.*

\* Of this opinion seems the divine Hippocrates, who in his admirable treatise of air, water, and situations, after giving a catalogue of distempers, which those cities are chiefly liable to which are obliged to make use of stagnant and marshy waters, and which have a southern situation with respect to the sun and winds, says, these are the distempers to which a southern situation is principally subject, unless some epidemical disease, from the change of the seasons, prevails, of which the ordinary distempers participate.

which is called symptomatic intercurrents : these last are it fact of the same species of the then prevailing stationary fever, but its apparent symptoms are changed into the likeness of some one essential intercurrent fever, such as the particular seasons of the year, or the manifest qualities of the air are used to produce : these three are all the species to which the whole tribe of epidemical diseases are reducible ; an accurate knowledge of them, and a particular regard to their distinctions, are of the utmost consequence towards finding out the nature of any prevailing epidemic fever, and curing it successfully.

By this time, gentlemen, you perceive that all epidemic diseases are reducible to these three species, viz. stationary, essential intercurrents, and symptomatic intercurrents. Now, so long as the general constitution, which gives rise to the stationary fever, continues, (which is sometimes three or four years together,) the fever itself exists, sometimes in its own simple shape and appearance, and at other times puts on symptoms common to the essential intercurrents, such as pleurisy, quinsy, &c. according to the particular season of the year that favours the production of these essential intercurrents : these appearances or symptoms may deceive the unwary or injudicious, so far as to make them imagine them to be the very disorders their external symptoms seem to imitate.\* But to a discerning physician, who is capable of examin-

\* Though every particular disease of the fluids, in various epidemical constitutions, appears to inattentive observers the same, with regard to their names, signs, and their consequences in some measure, yet the same diseases appearing in one epidemic constitution differ exceedingly from those produced in another, with respect to their obscure natures, their appearances not observable except by the judicious, the various times of their increase, state, coction, crisis,



ing all the characters of the disease, they will be found to retain the essential (though latent) characters of the stationary fever: the morbid matter being determined either on the pleura or throat by the particular season of the year, or manifest qualities of the air favouring the epidemical production of an essential pleurisy or quinsy.

And such is the difference between these two disorders, viz. a real essential intercurrent pleurisy, and a symptomatic pleurisy, that the intention of cure is as different as the diseases really are; the one requiring a method peculiar to itself, the other requiring special regard to the latent stationary fever of which it is only a symptom. It sometimes happens too, that the symptoms of two essential intercurrents are blended with each other, and form a complicated fever.

To illustrate this doctrine of epidemic fevers I shall transcribe a passage from the excellent author I mentioned above: speaking of intercurrent fevers, he says, " But  
" here it must be carefully noted, that though the diseases  
" I am to treat under the title of intercurrents, are most,  
" if not all of them essential diseases, yet, frequently,  
" certain disorders happen in stationary fevers, resembling these intercurrents as to the phenomena, and likewise characterized by the same name; *which, however,*  
" *are manifest symptoms of those fevers.* Now in this  
" case, they are not to be treated by the method which is to  
" be used when they are essential diseases, *but rather by*

effect, event, and method to be pursued in the cure: hence it is evident that they require a different administration of the non-naturals, different treatment and medicines.

*Boerhaave's Aphorisms, 1410-11. No.*

“ *that which the fever requires, whereof they are now*  
“ *symptoms, which is to be slightly adapted to their par-*  
“ *ticular cures ; and great attention is to be had to the*  
“ *fever of the year, and to find out the method by which*  
“ *it may be easiest conquered, whether by bleeding,*  
“ *sweating, or any other procedure ; for if this be dis-*  
“ *regarded, we shall frequently mistake, to the great detri-*  
“ *ment of our patients.*” This method of exploring the nature of diseases, and adapting their cure, (contrary to the humour that had long prevailed, of endeavouring to reduce all the phenomena of diseases to particular systems of philosophy,) was a work reserved for Dr. Sydenham, in which he has succeeded so well, as to be justly stiled the British Hippocrates. We are told by the late celebrated Boerhaave, in his method of studying the art of physic, that none of the moderns engaged him longer, or improved him more, than Sydenham ; of whom he has made this honourable mention, that he frequently perused him, and always with greater eagerness ; and assured his pupils that no physician since the venerable Hippocrates, had wrote of diseases with so much exactness. In an oration he spoke, recommending the study of Hippocrates to his pupils, he laments that few (if any) of the modern writers on physic, have attained to the perfection of the ancients. I can only, says he, mention one great man, Thomas Sydenham, the ornament of England, and the Apollo of the art ; whom I never consider, but my mind presents me with the genuine picture of an Hippocratic physician : and to whom physic is so much indebted, that all I can say falls short of his merit.

From what has been said, I believe, gentlemen, you will perceive that it is absolutely necessary, in order to

form a right judgment of any new species of intercurrent fever, that may at any time appear, (such as the fever we are now examining,) if we would proceed upon the plan recommended by the great authorities before mentioned, and which is unquestionably right from observation and experience, we must, I say, first consider the stationary fever then existing, and examine whether its essential characters in any degree appear in this new fever; the next inquiry that appears necessary, is the manifest qualities of the air, the season of the year, and what species of essential intercurrents generally belong to it, whether pleurisy, quinsy or others, and weigh well with ourselves, whether this new fever puts on any new symptoms common to it; carefully observing the method nature takes in digesting the disease; and in what manner it is expelled, uninterrupted by the preposterous use of medicines.\* To apply these reasonings to the present purpose, it seems clearly evident, that the reigning stationary fever of the present general constitution of this

\* Upon the invasion of any unknown epidemical distemper, the physician will receive some information with respect to the cure; first, by reducing the distemper to some more known species which it most resembles; secondly, by observing its tendency at the vernal and autumnal equinoxes, at which times it is generally most prevalent; thirdly, by attending to the spontaneous phenomena which precede, accompany, or follow the death or recovery of the patients, or the better or worse state of the disorder; fourthly, by diligently remarking any benefit or injury received from whatever the patients are unavoidably obliged to do, whatever is taken into or discharged out of the body; fifthly, by comparing the cases of a great many patients labouring under the distemper at the same time; sixthly, by abstaining from all remedies which are dubious, which exagitate and induce a considerable change in the humours, and thereby obscure the genius of the disease.

*Boerhaave's Aphorism, No. 1418.*



place, and which has now existed several years, is what is generally called the *yellow fever*, which has actually changed the nature of all the intercurrents, ever since it first appeared amongst us. This general constitution of the air has disposed most of the regular intermittent fevers into irregular remittents ; and in some seasons of the year into a long continued fever, attended with the worst train of nervous and putrid symptoms. Neither has it failed in every year since its first appearance, to shew itself towards the autumnal equinox in its own simple form, attended with its principal deadly characteristic symptom, the black vomit. It was this fever, disguised by the prevailing intercurrent of the season, that appeared last summer, and proved fatal to some young gentlemen and others in this city : and not losing sight of this clue, I conceive that the present mortal disease in the country, owes its cause to this original, primary fever, disguised by the now prevailing constitution of the air and season favouring the production of an intercurrent pleurisy. I am confirmed in this opinion, from examining the symptoms attending the disorder, and comparing them with those of the stationary fever, of which the following is a general description.

The patient in this malignant pleurisy, is first seized with a shivering or rigor, which is soon succeeded by a pain in his back and head, an early disposition to vomit, with great oppression and anxiety. Soon after the fever is formed, these appearances are followed with an acute pain in the breast and side, resembling peripneumonic symptoms, attended with a laboured and painful respiration, a frequent cough, by which a crude, glazy, frothy spittle, lightly tinged with blood, is discharged ; light de-

liriums, through the whole progress of the disease, not constant, but frequently returning ; the tongue for the most part parched and dry ; but the skin inclined to be moist and sweaty, which, if encouraged, the skin and coats of the eyes become extremely yellow ; the blood appears rather dissolved and thin, than viscid ; the pulse in most cases soft and frequent. This disease generally ends in the death or safety of the patient on the fifth day, sometimes on the third and fourth from the invasion of the distemper. In those that have died, it has been observable, that some hours before their death, they have recovered their senses, and appeared easy, but soon after have unexpectedly and suddenly expired. Most of these symptoms, together with the time it takes in going through its stages, are similar to the stationary fever,\*

\* The symptoms attending the yellow fever in the cities of New-York and Philadelphia were these : first, a sudden prostration of strength and spirits, great anxiety, a burning pain in the stomach, frequently extending to the bowels ; in some, acute pains in the head and back, attended with an ardent fever and extreme thirst, accompanied frequently with light delirium ; a vomiting almost from the beginning of the disease, which, if not timely suppressed, was irrestrainable through the whole progress of it, and after continuing some time, appeared of the colour and consistence of coffee grounds ; the tongue dry, but the skin inclining to be moist ; from the dissolution and caustic acrimony of the blood and juices, violent hemorrhages from the nose, mouth, and sometimes from the corners of the eyes ; the skin and whites of the eyes on the second day turned yellow ; the disorder ended in the death or recovery of the patient on the third, fourth, or fifth day ; sometimes before the patient's death there was frequently a sudden remission from pain, without any apparent cause ; a weak intermitting pulse, and soon after a calm and gentle death. This fever has been frequent, not only in the English West-Indies, but in the Spanish and French American islands. From Barbadoes it is supposed to have been conveyed to the continent, where it has raged at Carolina, Virginia, Pennsylvania, and New-

excepting the pain in the side, which appears to me to arise from the acrimony of the disease, which (in its simple state used to be thrown upon the stomach and bowels, producing violent pains, inflammation, and sometimes mortification of the parts) is by the present disposition of the air and season of the year, favouring the production of an epidemic pleurisy, determined upon the pleura and lungs, and produces its tragical effects upon these organs. It is further observable, that the disease is aggravated by the common method of treating an *essential pleurisy*, and is found to be relieved by sweating and diluting methods, which is a prevailing argument to consider it in this light, as that method was always found to be the most successful in curing the original fever ; of which kind I suppose this to be, and the pain in the side and breast only accidental symptoms.

I cannot dismiss this subject without communicating a remarkable instance of two essential intercurrent fevers being blended together, so as to form a compound of both. This I formerly communicated to Dr. Kearsley and Mr. Franklin of Philadelphia, and was in my opinion the only reason why the practice of inoculation proved so unsuccessful when the small-pox last appeared in this city. This distemper was brought into this city when an eruptive fever was epidemical, and very general ; and immediately the small-pox was propagated by inoculation in a great many different parts of the town, while the constitution of the air which favoured the erup-

York. Dr. Warren, who has written a very exact history of its appearance in Barbadoes, has very elegantly described its symptoms, and with great judgment directed a proper method of cure. Dr. Mitchell has done the same from its appearance in Virginia.

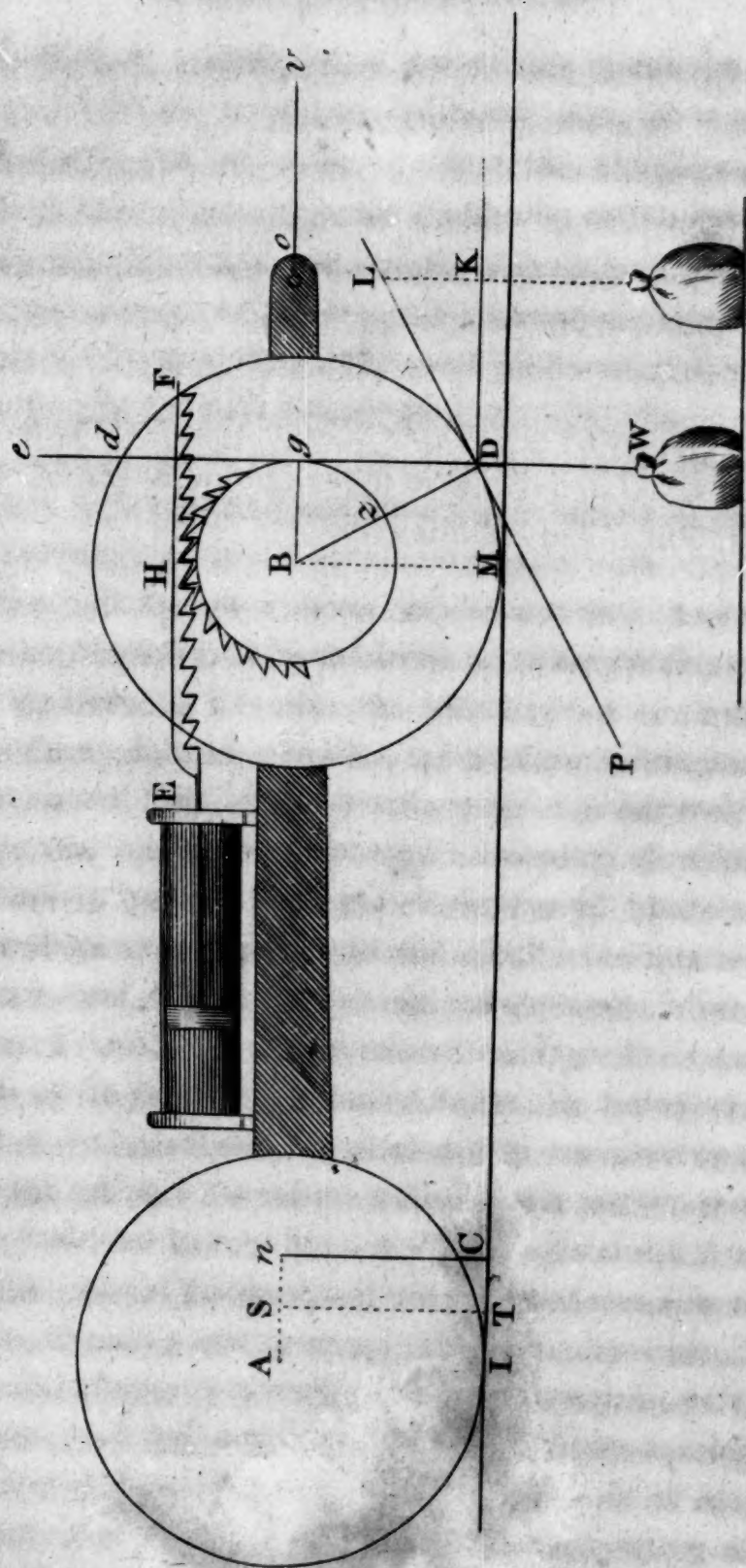


tive fever, was at its height. The consequence of which was, that so long as the symptoms of the small-pox appeared from the inoculation, the then prevailing constitution of the air changed its symptoms in a great measure to its own likeness ; most of the characteristic symptoms of the preceding fever accompanying those of the small-pox ; until by degrees the small-pox, spreading over the city, extinguished the eruptive constitution, and then existed in its own simple form ; after which inoculation was practised with its usual success. From whence it appears that that method should be enterprised with great circumspection and care ; especially when any other acute epidemical fever rages, or has the ascendant.

From this account, gentlemen, of acute diseases, what sagacity and caution appear to be necessary in the physical management of them, where a mistake as to the real nature of the disorder, the true intention of cure, or application of remedies, must infallably pervert the order and economy of nature, in digesting and expelling the disease, and very much endanger the patient ? It was this happy sagacity, joined with a natural physical genius, which, more than his learning, gave Dr. Radcliff his fame, and made his practice so remarkably safe and successful.

It was from these reflections Dr. Sydenham used to say, he thought it as much incumbent upon a physician to read nature as books. And Sir William Temple, convinced of these truths, queried whether the general practice of physic, as it was in all hands, had done more good or harm to mankind. From the whole, gentlemen, I think it necessarily follows, that though the art of physic and surgery, under a judicious direction, must derive







great advantages to society ; yet, these arts, in the hands of the rash and unskilful, too often occasion the most fatal mischiefs ; as errors of this kind are errors of the most dangerous consequence.

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## II.

AN INVESTIGATION *of the Principles of STEAM CARRIAGES.* Communicated to the Editors by the late JAMES SHARPLES, *Esq. of this city.*

THERE is no mechanical project, except the perpetual motion, that has been so often and so unsuccessfully attempted, as the self-moving carriage, or carriage to go by means of some internal power borne along with it ; and I believe there is no engine of this kind in use, except the Bath chair, by which gouty persons can move themselves about from place to place, upon level ground, with a slow motion. Some attempts have been made to give motion to carriages by means of steam ; but none ever promised more than the one made by Mr. Trivithick, who invented an engine to act with steam of so high a temperature, as to preclude the necessity of using the condensing apparatus and air-pump. Having got rid of these incumbrances, he was confident of success. A carriage was constructed for the purpose, every thing was well contrived, and as the inventor was a man of acknowledged abilities and ingenuity, it was generally believed he would succeed ; but as I had been led into much reflection on this subject by some projects of my own, I made no hesitation to predict its failure to some mechanical philosophers of high repute in England, who strenuously combated the reasonings and theorems which oc-

casioned me to pronounce so decidedly ; hence I am inclined to believe, that a strict investigation of this subject has not appeared in any book of natural philosophy, and if I should be fortunate enough to throw any new light upon it, I shall please myself with the reflection that I may be the means of preventing ingenious men of ardent minds from squandering their property, or ruining themselves by so wild a project.

I have here given an outline of Mr. Trivithick's carriage and engine.

A and B are the fore and hind wheels ; on the axle B a ratchet wheel is fixed for the piston rod of the cylinder E to act against, and if roads were perfectly hard, smooth, and level, such an engine would probably have the advantage over common carriages, because a small power continually exerted would give a degree of velocity that could not be supported by horses ; but in estimating the powers necessary to impel carriages on roads in general, we must take into consideration the impediments that are usually met with, all of which may be considered as so many short inclined planes. Thus a force to drive the wheels A B over the obstacles D C, would, the first moment of exertion, be the same as a continued force to carry them up D L, provided the inclined plane was perfectly hard and smooth ; now  $g$  D M may be considered as a bended lever,  $g$  D being the long arm, and M D the short one, and the power drawing out of the carriage in the direction  $o$   $v$  would be to the whole weight of the carriage and load, pressing perpendicularly in the points I and M, as M D is to  $g$  D, the points of the obstacles being the fulcrum or centre of motion. These proportions

being as four to seven, and as four horses can, by a sudden exertion, raise 2000 lbs. perpendicularly by a rope over a pulley, (*Desagueliers*, vol. 1. p. 260.) four horses would raise a weight in the carriage and load over the obstacles C D equal to 3500 lbs. but no force in the engine acting against the ratchet wheel at H would effect the same. We must keep in view, that whilst the action within a carriage is exerted in any line of direction against the ratchet wheel, its reaction is against some part of the carriage in a contra-direction, and that the intensity of its action is the same, whether its direction be horizontal, oblique, or perpendicular. Now let the direction of the force be changed from the direction E H to *e g*, and nothing, in my opinion, can be more self-evident, than the impossibility of forcing the wheels over the obstacles by a power exerted perpendicularly upon the centre of motion ; for it would be absurd to attempt to raise a weight suspended on either of the ends of a scale-beam, by the application of a perpendicular force upon the fulcrum.

A scientific friend of mine near Brunswick, who at first opposed the foregoing proposition, afterwards not only convinced himself, but had formed a demonstration of the truth of it. As I am not acquainted with the mode of his solution, I shall endeavour to supply it.

Let it be required to draw the carriage wheel up the inclined plane P L, by means of any power or weight W suspended by a chain coiled round the ratchet wheel. If the power W will descend by rolling the carriage wheel up the ascent, the descending line of its power must hang beyond the centre of motion on that side which would



have a tendency to raise the carriage wheel, and it would consequently have some mechanical force. But to demonstrate that the wheel will not descend, let  $PL$  be drawn perpendicular to the radius  $BD$ , and let the length  $BD$  be set off from  $D$  to  $L$ , it is evident that the wheel, in rolling from  $D$  to  $L$ , will apply as much of its circumference on the inclined plane as is equal to  $DL$  or  $DB$ ; and it is also evident that the weight  $W$  will draw as much in length of chain from the ratchet wheel, as is equal to the line  $Bg$ , which is the radius of the lesser circle; for the greater circumference is to the lesser one, as the greater radius is to the lesser radius; then set off  $LK = Bg$ , in the angle  $DLK$ , equal to the angle  $DBG$ ; draw  $KD$  and  $gD$ ; then the triangles  $DLK$  and  $DBG$  will be every way equal and similar; consequently, the line  $LK$  will be equal in length to the line  $Bg$ , which has been shown to be the length of chain drawn off from the ratchet wheel; but as the line  $LK$  lies all above the horizontal line  $DK$ , the length  $DW$  will have received no addition, and the weight  $W$  must have been carried along in a line parallel to  $DK$ , and consequently cannot have descended or ascended, which proves that the power is exerted perpendicularly over the centre of motion.

Let us now consider such impediments and inclined planes as present themselves in almost every road. If there were obstacles  $T$  under each wheel, any power out of the carriage, drawing in the direction  $ov$ , would be to the weight of the carriage and load, as  $AS$  to the line extending from  $S$  to the point of the obstacle, which being nearly as 1 is to 4, four horses would draw  $4 \times 2000 = 8000$  pounds in the carriage and load over such

obstacles from a state of rest. But an engine equal to the power of four horses, acting within the carriage, would only be adequate to forcing a weight of 2000 pounds over the obstacles, for the power is to the weight as the line  $AS$  is to the line  $Sn$ ; by reference to the previous definitions we shall find the point of contact of the wheel and obstacle  $T$  to be the fulcrum  $AI$ , the centre of gravity of the weight to be raised, and  $nC$  the line of direction of the power, and as  $AS$  and  $Sn$  are equal to each other, a force of 8000 would be required to raise 8000 over the obstacles  $T$ , (which would be about an inch and a quarter in height, if the wheels were 5 feet in diameter) or up an inclined plane of 7 or 8 degrees, the roads being perfectly hard and smooth, or up an ascent of 4 or 5 degrees in such roads as are generally found, for occurring hollows would be frequently more than 3 or 4 degrees. But I am of opinion the weight of an engine, carriage, and apparatus to sustain 8000 would weigh considerably more than 8000, so that all its force would be exerted in vain to overcome obstacles of a size so diminutive, or to impel its own weight up eminences of five degrees of general elevation.

To conclude: in whatever point of view we place this subject, we shall be more and more convinced of its futility.

## III.

*A Memoir upon the ORGANS OF ABSORPTION in Mam-miferous Animals, read at the Institute, on the 7th of August, 1809, by M. MAGENDIE, Doctor of Medicine of the Faculty of Paris, Professor of Physiology, &c. The experiments conducted by Doctors MAGENDIE and DELILE. Communicated to Dr. DAVID HOSACK, by A. R. DELILE, M. D. of the Institute of Egypt, &c.\**

AMONG the facts which I had the honour to report to the class, in a memoir upon the upas tieuté, the nux vomica, and the bean of St. Ignace, there is one which appeared to me worthy of more particular attention ; I mean the readiness with which those poisonous matters are absorbed and introduced into the sanguiferous system. It must be recollected, that it scarcely requires twenty seconds to convey these poisons from the peritoneal cavity to the spinal marrow.

The generally received ideas relative to the organs of absorption, do not admit of a doubt that the lymphatic vessels are the agents for conveying these poisons into the sanguiferous system. Thus, in the experiment where the poison was introduced into the middle of the thigh of an animal, there was but one way of explaining its absorption ; it must necessarily be admitted that it was ta-

\* For this, as well as other translations from some recent Spanish and French publications, which will appear in the future numbers of the Register, we are indebted to William A. Hosack, Esq. of this city.



ken from the wound by the lymphatic vessels of the parts with which it was in contact ; that after being absorbed it was carried by these vessels towards the glands of the groin ; that after traversing these bodies, it was conveyed, still by the lymphatic vessels, to the thoracic duct ; finally, that it was introduced into the sanguiferous system by the communications which the thoracic duct preserves with the subclavian veins, and principally with those of the left side.

Such ought to have been, and such, in fact, was our opinion, at the time of the publication of the memoir upon the strychnos. Nor were the experiments, of which I am about to give an account, undertaken with a view to discover new facts, but rather to add a degree of certainty to an explanation already admitted ; and our labours did not take a particular direction until a great number of facts obliged us to modify our view of this subject. But so rapid an absorption by vessels, whose principal characteristics are weakness and slowness of action ; a poisonous substance that so quickly pervades the difficult and winding route of the lymphatic glands, without any alteration therein, were two circumstances that ought, perhaps, to have made us entertain some doubts of the correctness of the received explanation. This explanation, however, is given by so many respectable persons, and is supported by experiments so positive, that even now, when we have many facts to oppose it, we dare not say that it wants exactness, but only, that it is not admissible under every circumstance.

Previous to any detail of our experiments, it will not be useless to relate, in a few words, an opinion which

for some time balanced the present prevailing belief relative to the organs of absorption.

This opinion, professed by Boerhaave, Haller, Méckel, Ruysch, Swammerdam, and others, was, that the sanguiferous veins, in common with the lymphatic vessels, possessed an absorbing power.

It is supported by different circumstances of structure, and by some physiological and pathological facts. A series of interesting experiments, undertaken and executed a few years since, at the veterinary school of Alfort, has also strengthened the probability of such absorbent property of the veins, but without producing entire conviction. It is well understood that an opinion established upon the physical structure of the organs, deduced from a sufficient and conclusive number of experiments, and supported by the names of Boerhaave, Haller, and Ruysch, ought not to be easily abandoned. Nor was less required than the anatomical discoveries of the last century, the correct experiments of Hunter and his brother, those of Cruikshank, Mascagni, Desgenettes, and others, to establish the belief that the lymphatic vessels only possess the absorbent faculty.

I will further cite, in support of the general opinion, some very curious experiments lately made by M. Dupuytren. This physiologist, who has kindly permitted me to report the principal results of his labours, tied the thoracic duct in several horses; some of them died in five or six days, others preserved every appearance of health. We know already by an experiment of Duver-

ney, by some observations on the thoracic duct when obstructed, and above all, by the experiments of Landrin, that the thoracic duct may cease to convey the chyle into the subclavian vein without being followed by the death of the animal; it is true, we also know, that some animals died in consequence of a ligature round the duct; but we are entirely ignorant of the cause of this diversity in the results. M. Dupuytren, by his experiments, has found one very satisfactory. In the animals that died in five or six days, from the ligature round the thoracic duct, he always found it impossible to pass any injection from the inferior part of the duct into the subclavian vein; consequently, it is very probable, that the chyle ceased to be conveyed into the venous system immediately after the application of the ligature. On the contrary, in all the animals who have survived the application of the ligature, it has always been easy to make every kind of liquid pass from the inferior part of the duct to the subclavian veins, by means of the very numerous communications between these two points by the lymphatic vessels, placed alike in the posterior as in the anterior mediastinum.

I have personally assisted M. Dupuytren in opening a horse, the thoracic duct of which he had tied more than six weeks before, and I easily satisfied myself that there existed evident communications between the inferior portion of the duct and the subclavian veins, although this canal was entirely destroyed at the place of the ligature.

I now proceed to the experiments, which I made, for the most part, in concert with M. Delile, to determine, whether the lymphatic vessels are really the only ones



by which foreign substances enter into the venous system.

A circumstance that has always thrown some obscurity over the experiments upon absorption, is, the difficulty of demonstrating, with certainty, the passage and presence of absorbed matters, either in the lymphatic or sanguiferous vessels. We have not these inconveniences to fear in employing the *upas*, or the *nux vomica*; for it is known that two centigrammes of these substances produce effects too remarkable to be mistaken.

Would the ligature round the thoracic duct stop the passage of the poison in the sanguiferous system, and consequently, its effects upon the spinal marrow? This was the first question that we proposed to resolve.

I have applied in a dog a ligature to the thoracic duct, a little before its opening into the left subclavian vein; I afterwards introduced a solution of the *upas* into the cavity of the peritoneum. The effects of the poison were as prompt and marked as if the thoracic canal had not been tied. I have tried the same ligature in other animals; but instead of introducing the poison into the cavity of the peritoneum, I introduced it either into the pleura, or into the stomach, the intestines, or muscles of the thighs, &c. The effects have always been equally rapid and intense, as if the thoracic canal had been free.

Decisive conclusions cannot be drawn from these first essays, for we know that the thoracic canal is not the only point of communication between the lymphatic

and venous systems. There is ordinarily on the right side, a second thoracic duct, almost as considerable as that on the left; the large lymphatic vessels often open themselves solitarily into the subclavian veins; and more frequently still the thoracic duct has several mouths into the vein where it terminates.

One of these circumstances was found to occur in the animals subjected to our experiments; and we must have recourse to other trials, from which other results, less equivocal, may be deduced.

Upon a dog who had eaten a large quantity of meat seven hours before, in order that his abdominal lymphatic vessels might be easily perceived, we made an incision through the parietes of the abdomen, and took from thence a coil of the small intestines, upon which we applied two ligatures about five inches apart from each other. The lymphatics, which had their origin in this turn of the intestine, were very white and very apparent from the chyle which they contained. Two ligatures were placed at the distance of one centimetre upon each of these lymphatics; we cut these vessels between the two ligatures; we took great care in this part of our experiment, and assured ourselves, by every possible means, that the curvature of the intestine, taken from the abdomen, had no further communication with the body by the lymphatic vessels. Five arteries and five mesenteric veins ended in the portion of the intestine comprised between the two ligatures; four of these arteries and four of the veins were tied and cut in the same manner as the lymphatics; the two extremities of the curvature of the intestine were cut and entirely separated from the rest of

the small intestine. Thus we had a portion of the intestine about five inches in length, not communicating with the rest of the body but by one artery and one mesenteric vein ; these two vessels were separated at the distance of four fingers breadth. We even raised the cellular substance, least some lymphatic vessels might lie there concealed. We had nothing further, by which to obtain a positive result, than to inject a small quantity of the *upas tieuté* into the cavity of the intestinal curvature. This was also done with proper precautions to prevent the escape of the injected liquor. The curvature of the intestine, enveloped in fine linen, was replaced in the abdomen ; it was then precisely one o'clock. To our great astonishment, about six minutes after, the general effects of the poison diffused themselves with their usual intensity, and in such a manner that every thing proceeded as if the curvature of the intestine had been in its natural state.

The animal being dead, we examined the parts ; no ligature was displaced, nothing could make us suppose that the poison had passed into the abdominal cavity.

This experiment, repeated several times without any modification in the result, appeared to us most conclusive ; it proves, at least, as far as can be proved in physiology, that the lacteal vessels are not the exclusive organs of intestinal absorption.

This kind of absorption, different from that of the lymphatic, may be peculiar to the intestines ; it would be important to know if it could be discovered to exist in the other parts.



We separated from its body, the thigh of a dog, previously rendered comatose by opium, (in order to spare it the pain of a difficult experiment ;) this separation was so made, that the thigh still communicated with the trunk by the *crural* artery and vein. We took, with regard to these two vessels, the same precautions as for the mesenteric vein and artery in the preceding experiments ; that is, we isolated them on an extent of four centimetres, and raised their cellular *coat*, least it should conceal some lymphatic vessels ; we then inserted two grains of the poison in the foot, and waited the effects. They manifested themselves with as much promptitude and energy, as if the thigh had not been separated from the body ; insomuch, that the first signs of the action of the upas appeared before the fourth minute, and the animal died before the tenth.

It may be objected, that notwithstanding all the precautions taken, the arterial and venous parietes still contained some lymphatics, and that these vessels were sufficient to give passage to the poison. It were easy to refute this objection.

I repeated, upon another dog, the preceding experiments, with this modification, that I introduced into the crural artery a small quill, upon which I fixed this vessel by two ligatures ; the artery was afterwards cut circularly between these two bands. I did the same to the crural vein ; so that there was no longer any communication between the thigh and rest of the body, unless by the arterial blood which comes to the thigh, and by the venous blood which returns to the trunk. The poison introduced into the foot produced its general ef-

fects in the ordinary time, that is, in about four minutes. It may be deduced, I believe, from these different experiments, that the lymphatic system is not, at least in certain cases, the exclusive route that foreign substances take to arrive at the venous system.

This new mode of absorption, much more direct than that by the lymphatics, presents the means of easily conceiving the rapidity with which the different deleterious and other matters are absorbed, as well as the rapidity with which they produce their effects upon the system.

But what are the organs that first absorb the poison from the parts where it has been introduced? Are they the radicles of the veins, or are they rather the capillary lymphatics, which, having immediate anastomosis with the sanguiferous capillaries or exhalents, would immediately diffuse the poison through the venous system?

The experiments which I have just related, joined to those which have been made on the same subject, appear to me totally insufficient to decide either of these questions; only, it ought to be remarked, that our experiments are strongly in favour of a direct absorption by the veins.

But it is a fact, rendered evident by the preceding experiments, and upon which it is necessary to pause a moment, that the venous blood becomes charged with the poison, and that by the intervention or means of this blood, the poison produces its deleterious action upon the system. In fact, if in the experiments where I had se-

parated the thigh from the trunk, we suspend the course of the venous blood, by compressing between two fingers the crural vein, we lessen, and even totally suspend, the production of the effects. The blood of an animal, in which the signs of action of the *upas* is developed, contains then, some portion of poisonous matter ; indeed, it may be said to be really poisoned. It were curious and interesting to know, if this blood carried into the circulatory system of a healthy animal, would produce effects similar to those it had upon the animal itself. At first sight, we are led to believe that this is extremely probable, even that it is certain. The following experiments will shew with what care we ought, in physiology, to distinguish that which is probable, from that which is proved by experiment.

We passed the arterial blood of an animal, in which the tetanus caused by the *upas* was manifest, into the jugular vein of a healthy animal ; the transfusion lasted near twenty minutes, so that the healthy animal received a very considerable quantity of poisoned blood, which at the first moment of the experiment, was of a red and vermillion colour, and which afterwards became violet and black, when the *upas* had produced asphyxia. There did not, however, appear any irritation of the spinal marrow, and the animal only experienced what happens in common transfusions, made with care. I mean, that it had, for some hours, a very marked acceleration of the inspiratory and expiratory motions, as well as a very abundant pulmonary exhalation. Frequently repeated, this experiment has always produced the same results.

We were now certain, that the arterial blood of



animals, poisoned by the *upas tieuté*, the *nux vomica*, or the *bean* of *St. Ignace*, was not susceptible of producing similar effects on other animals; it would not be, perhaps, the same with the venous blood. It may be presumed, that the respiratory action changed the nature of the poisonous substance; and this alteration might, to a certain degree, give the reason, why the transfusion of the arterial blood of animals poisoned by the strychnos, is not followed with bad effects.

This circumstance did not take place with the venous blood, which returns from the part where the poison has been introduced. After the experiments reported in the memoir upon the *upas*, and in this, it is impossible to doubt, that this blood does not transport the poison to the lungs. It is very probable, that introduced into the circulatory system of another animal, it would produce effects similar to those which it caused upon the animal on which the inoculation of the poison was made.

A small piece of wood covered with two grains of *upas tieuté*, was stuck into the thick part of the left side of the snout of a dog. Three minutes after this introduction, we passed into the venous system of another dog, the blood of the jugular vein of the side where the introduction of the poison had been made. The transfusion commenced about one minute before the first signs of the *upas*; it did not cease until the death of the animal who experienced it. No appearance of irritation of the spinal marrow was perceived in the animal who received so great a quantity of poisoned blood.

Although these experiments were repeated several times,

with variations in the mode of introducing the poison, we never could perceive in the healthy animals, who had suffered the transfusions of poisoned blood, any thing which resembled the effects of the strychnos.

Results so positive, appear to us of a nature to warrant the conclusion, that the venous blood of animals poisoned by the *upas*, the *nux vomica*, and the *bean of St. Ignace*, is no more capable than the arterial blood, of producing upon another animal the effects which it will cause upon the animal from which it was taken.

If there still remained any doubts, they would be removed by the following experiment, which was repeated several times.

As in the experiments above related, we separated from the body the thigh of an animal, isolating as before the crural artery and vein ; we introduced the poison into the separated foot, and transfused the blood of the crural vein into the jugular vein of a sound animal. The passage of the blood from one animal to the other, lasted more than ten minutes, a time more than sufficient for the production of the effects of the *upas*. But no sign of the action of this poison was perceived, either in the one or in the other animal. The one preserved perfect health, the other died in a few days, in consequence of the amputation of the thigh, and from the loss of blood which was transfused.

It must not, however, be thought, that in this experiment the transfused blood, by some particular cause, had

no deleterious properties, for the following experiment proves the contrary.

As in the preceding experiment, I separated the thigh from the body; three minutes after introducing the poison into the foot, I passed the blood of the crural vein into the jugular vein of another animal; the transfusion was prolonged five minutes without producing any effects. I then stopped it, and disposed things in such a manner, that the blood of the crural vein should return to the animal to which it belonged. Almost instantly this animal exhibited evident signs of the action of strychnos on the spinal marrow.

From the different experiments reported in this memoir, we must, I think, conclude,

1st. That the lymphatic vessels are not always the route followed by foreign matters, to arrive at the sanguiferous system.

2d. That the blood of animals, upon which the bitter strychnos have produced their deleterious effect, cannot produce any fatal effects upon other animals.

As to the explanation of this singular phenomenon, it would be, I think, premature to give it at present. In physiological science, we ought to be sparing of conjectures, and prodigal of facts.

MAGENDIE, D. M. P.

*Note.*—This memoir has received the approbation of the Institute.



#### IV.

*An original paper of the late Lieut. Gov. COLDEN, on a new method of PRINTING discovered by him ; together with an original letter from the late Dr. FRANKLIN, on the same subject ; and some account of STEREOTYPING, as now practised in Europe, &c. by the Editors of the Register.*

WE are gratified in being able to lay before our readers the following paper, entitled "New method of Printing," found among the papers of the late lieut. gov. Colden, and addressed to Dr. Franklin, together with a letter in reply from Dr. Franklin, lately presented to us for publication by C. D. Colden, Esq. of this city. ED.

##### " NEW METHOD OF PRINTING.

" As the art of printing has, without question, been of very great use in advancing learning and knowledge, the abuse of it, as of all other good things, has likewise produced many inconveniences. The number of books printed on the same subject, most of which are nothing but unskilful and erroneous copies of good works, written only for ostentation of learning, or for sordid profit, renders the path to knowledge very intricate and tedious. The reader, who has no guide, and the greatest number have none, is lost in the wilderness of numberless books. He is most commonly led astray by the glaring appearances of title pages, and other artifices of the mystery of bookselling.

" It is likewise a common complaint, that a poor author

makes nothing near the profit that the bookseller does of his labour ; and probably, the more pains the author has taken, the more difficult the performance, and the more masterly it is done, the less profit to him ; for the good books, like jewels, never loose their intrinsic value ; yet, they have fewer purchasers than Bristol stones, and the sale of them is slow.

“ As the lessening or removing of some of these inconveniences, may be of use to the republic of letters, I hope to be excused in making the following attempt for that purpose, by proposing a *new method of printing*.

“ Let there be made of some hard metal, such as copper or brass, a number of types, or rather matrices, on the face of each of which, one letter of the alphabet is to be imprinted *en creuse*, by a stamp, or such other method by which the matrices for founding of types are commonly made. They must be all of the same dimension, as to breadth and thickness, with that of types, but half their length seems sufficient. Their sides must be so equal and smooth as to leave no vacuity between them when joined. There must likewise be a sufficient number of each letter or character, to compose at least one page in octavo, of any book.

“ These matrices, I suppose, may be cast in a mould, or a plate of copper may be divided exactly into squares, and the letter or character be stamped into the middle of each square, and the squares afterwards cut asunder by a proper saw. The best method of making these will be easily discovered by those whose business it is to make founts for printing types.

“When a sufficient number of each letter and character is obtained, they are to be placed in the same manner that types are, when composed for printing, only that they must all stand directly as they are read, and as they will appear afterwards on the paper.

“The composure of one page, after it is carefully corrected, is to be placed in a case or mould, fitted to it, of the length and breadth of the page, and of such depth as to cast a plate a quarter of an inch thick, which will perfectly represent a page composed in the common manner for printing.

“As to the art of casting the plate perfect, founders and type makers must be consulted; for the composition of the metal, and for the flux for running it clean and clear, so that no vacuities be left; for which purpose, I am told, that the funnel, by which the melted metal is poured in, being made large, and the filling it with the melted metal after the mould is full, is of use to make the letter every where full and complete. For, by the weight of the metal in the funnel, the liquid metal in the mould is pressed into every crevice. The funnel's extending the whole length of one of the sides, gives, likewise, free vent to the air.

“Or, after a page shall be composed, as before mentioned, and the types and matrices well secured in a frame upon a strong plate, they may, by a screw, be pressed upon a sheet of melted lead, and thereby a plate of lead be procured, representing as the former a page composed of types for printing. Which of the methods are most practicable artists can best determine.



“After the page shall be thus formed the matrices may be loosened and dispersed into their proper boxes, and may serve for as many other pages as types in common printing do.

“When a number of pages, sufficient for a sheet, are thus made, they may be carried to any printing press, and such a number of sheets as shall be thought proper be cast off, and then be laid by till more copies be wanted.

“I choose an octavo page, because, if the page title and page number be left out, as likewise the directions and signatures at the foot of the page, by joining two pages together, it may be made a quarto, or by joining four, a folio. Thus several editions in octavo, quarto, and folio, may at once be made, to suit every buyer's humour.

“The page titles, number, and bottom signatures may be cast in small moulds apart, and joined, as may be proper.

“The most convenient size of a page is that of small paper, so as to fill it up, and to leave very little margin; then by adding the page titles, or marginal notes, or notes at the bottom, all cast in frames separately, the large paper may be sufficiently filled.

“I believe that this method of printing, every thing considered, will not be more chargeable than the common method. A thousand, or some thousands sometimes, of copies, are cast off at once in the common method, and the paper and pressman's labour of what is not speedily sold may, or must lie dead for some years, whereas in this

method, no more need be cast off at a time than may well be supposed to sell speedily. If I be not mistaken, the metal necessary for one sheet will not exceed the value of four hundred sheets of paper, and in the common method several hundred sheets lie useless for, sometimes, many years. If the book should not answer, there is a great loss in the paper, whereas the metal used in this method retains its intrinsic value.

“ I shall instance some of the advantages in this method which induce me to communicate my thoughts to others.

“ 1. An author by this means can secure the property of his own labour.

“ 2. A correct edition is at all times secured, and therefore may be useful in the classics, trigonometrical tables, &c.

“ 3. A weak and ignorant attempt on the same subject will be discouraged, for as a new edition of a valuable book is continually secured, without any new expense, booksellers will not readily hazard the publishing of books of the same nature.

“ 4. But what I chiefly value this method of printing for, is, from the advantages it gives an author in making his work perfect, and in freeing it from mistakes ; for, by printing off a few copies of any sheet, and sending them among his friends, and by suffering them to fall into the hands of a malevolent critic, he may have an opportunity of correcting his mistakes, before they appear to the world. By the same means he may make his work more com-

plete than otherwise he could, by the assistance which his friends may give him in several parts of it. It is for these reasons chiefly, that I propose the plates not to exceed an octavo page, and to have no signatures ; for in case of a mistake, the loss of one page may correct the error, and where improvements or additions are necessary, as many pages may be intermixed as shall be necessary, without any inconvenience, and small explications may be made by the marginal notes.

“ Lastly. The greatest advantage I conceive will be in the learned sciences ; for they often require a long time to bring these to perfection, and require the assistance of others in many particulars. Many a valuable piece has been lost to the world by the author dying before he could bring his work to the perfection he designed. Now, by the assistance which he may have by this method from others, this time may be much shortened, and the progress he has made may be preserved for others to continue in case of his death. An author may publish his work in parts, and shall continue, in many cases, to complete and make them more perfect, without any loss of what was done before. By this method likewise, a man of learning, when poor, may leave some part of his estate in his own way for a child, as mechanics often do for their’s.

“ Whether the method I propose will answer the end designed, or whether it be practicable, I cannot with sufficient assurance say ; because we have no artists in this country who can make the experiment, neither can they have encouragement sufficient to tempt them to make the trial. However, I hope to be excused, by the use of the



design, and as it may chance to give some hint to a skilful person to perform effectually what I only aim at in vain.

“If the charge of lead or metal plates be thought too great, I know not but that the impression may be made on thin planes of some kinds of wood, such as lime tree or poplar, which have a soft smooth grain when green, and are hard and smooth when dry.

“Ever since I had the pleasure of a conversation with you, though very short, by our accidental meeting on the road, I have been very desirous to engage you in a correspondence. You was pleased to take some notice of a method of printing which I mentioned to you at that time, and to think it practicable. I have no further concern for it than as it may be useful to the public ; my reasons for thinking so, you will find in the inclosed copy of a paper which I last year sent to Mr. Collinson in London. Perhaps my fondness for my own conceptions may make me think more of it than it deserves, and may make me jealous that the common printers are willing to discourage, out of private interest, any discovery of this sort. But as you have given me reason to think you zealous in promoting every useful attempt, you will be able absolutely to determine my opinion of it. I long very much to hear what you have done in your scheme of erecting a society at Philadelphia for promoting of useful arts and sciences in America. If you think of any thing in my power whereby I can promote so useful an undertaking, I will with much pleasure receive your instructions for that end. As my son Cadwallader bears this, I thereby think myself secured of the pleasure of a line from you by him.”

Philadelphia, November 4, 1743.

SIR,

I received the favour of yours, with the proposal for a new method of printing, which I am much pleased with ; and since you express some confidence in my opinion, I shall consider it very attentively and particularly, and in a post or two, send you some observations on every article.

My long absence from home in the summer, put my business so much behind hand, that I have been in a continual hurry ever since my return, and had no leisure to forward the scheme of the society. But that hurry being now near over, I purpose to proceed in the affair very soon, your approbation being no small encouragement to me.

I cannot but be fond of engaging in a correspondence so advantageous to me as yours must be. I shall always receive your favours as such, and with great pleasure.

I wish I could by any means, have made your son's longer stay here as agreeable to him, as it would have been to those who began to be acquainted with him.

I am, Sir, with much respect,

Your most humble servant,

Dr. COLDEN.

B. FRANKLIN.

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The mode of printing above described is now known by the term *Stereotype*; and it is a curious fact that the stereotype process, said to have been invented by M. Herhan in Paris, and now practised by him in that city,

under letters patent of Napoleon, is precisely the same as that spoken of by Dr. Colden, more than sixty years ago.

It is more than probable that when Dr. Franklin went to France, he communicated Dr. Colden's "new method of printing" to some artists there, and that it lay dormant until about sixteen years since; when Herhan, a German, who had been an assistant to M. Didot, the printer and type founder of Paris, but then separated from him, took it up in opposition to M. Didot. We have conversed with gentlemen who have seen M. Herhan's method of stereotyping, and they describe it to be exactly what governor Colden invented. This fact established, there can be no doubt that M. Herhan is indebted to America for the celebrity he has obtained in France.

Since the above papers fell into our hands, we have endeavoured to obtain information respecting the different methods of stereotyping now in use. The following is the result of our enquiries.

By a book published in Paris about ten years since, by M. Camus, of the French national Institute, we find that a Bible was printed in Strasburgh, by one Gillet, more than a hundred years ago, with plates similar to those now used by Didot and Herhan, but not by any means so perfect. Gillet's moulds were made of a fine clay and a particular kind of sand found only in the neighbourhood of Paris. It is also stated that a number of other ingenious men had at various times produced plates tolerably perfect, by different processes, but we may safely infer, from the art having made no great progress until the time of Didot the elder, that their endeavours had not been crowned with much success.



At the beginning of the French revolution great quantities of paper money becoming necessary to supply the deficiency of specie either concealed or sent out of the kingdom by the rich, Didot was applied to by the national assembly to invent some kind of *assignat* or bank-bill, which should not easily be imitated ; and at this period it was that M. Didot first directed his attention to the means of producing, *in relief*, a set of plates, to print on a common printing-press, which were exactly *fac-similes*, and could not without much difficulty be falsified. This process was termed Polytyping ;\* as the mould in which the plates were cast was durable, and would produce any number of copies ; the usual mode of stereotyping being, as the French term it, *à moule perdu* ; it being necessary to make a new mould for every plate.

But as M. Didot's views were by degrees extended to the casting of pages for book printing, he found it unnecessary to use durable moulds, and therefore, after a year's experiment, invented a composition, which, like the sand used by brass-founders, might be wrought over again for different casts. The elegant editions produced by M. Didot and sons, are the best proofs of his success.

When the fame of M. Didot's invention reached England, lord Stanhope, an ingenious and wealthy nobleman, whose time and fortune are principally devoted to the advancement of the arts, made propositions to Mr. Andrew Wilson, of Wild court, Lincoln's Inn Fields, proprietor of the Oriental press, to assist him in such experiments as

\* We have seen some beautiful specimens of this art, produced by Mr. John Watts, of this city ; of whose undertakings we shall hereafter speak more at large.

might bring to perfection a new mode of stereotyping, of which his lordship had obtained some ideas. Mr. Wilson embraced the proposal; and after four or five years of incessant labour, they attained nearly all the advantages they had contemplated. Mr. Wilson, in the year 1802, built his foundry in Duke-street, Lincoln's Inn Fields, and in the following year disposed of the secret for six thousand pounds sterling, and some future advantages to Mr. Richard Watts, for the use of the university of Cambridge. In the year following he disposed of it on similar terms to the university of Oxford.\*

About two years ago, a brother of Mr. Watts of Cambridge, began a course of experiments in this city for a more cheap and easy manner of stereotyping, than any hitherto discovered; and, in spite of innumerable disadvantages, has succeeded beyond his utmost expectation. We have seen plates of his casting of the greatest perfection and beauty. The chief difficulty he has experienced arose from the jealousy and illiberality of the common type-founders, who refused to lend the little aid he required of them. It is agreeable to us, however, from our own observation, to be able to state that, by uncommon perseverance through accumulated obstacles, Mr. Watts has invented a method of casting the common types much more perfect than those made in the usual way; and now will proceed with his plates without the assistance of other artists.

\* The two Universities of England, have the exclusive right of printing Bibles and Prayer Books. Twenty or thirty presses are generally employed in that business alone; the classic departments requiring many others.

The principal defects in M. Didot and lord Stanhope's processes, arise from the softness of the moulds they employ, which are composed of plaster of Paris and some other ingredients. In taking them from the page, of which they are intended to cast a perfect copy, some part of the composition will always remain in the type, and leave the mould imperfect. After the plates are cast, there is consequently much work for an engraver, to make them fit for use. Mr. Watts' mould, being of solid materials, no such inconvenience can arise.

We have obtained some further important information on this subject, which we shall probably give in our next number.

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## V.

OBSERVATIONS *on* ARSENIC *and the* MURIATE *of* LIME, *in the treatment of* SCROPHULA ; *in a letter to* DAVID HOSACK, M. D. *of New-York, from* COLIN CHISHOLM, M. D. F. R. S. &c. &c.

Clifton, November 5th, 1810.

DEAR SIR,

Your observations on the use of the Ballston mineral waters, in various diseases, more especially those which relate to their impregnation with the muriate of lime, have brought to my recollection a very singular case of scrophula ; a statement of which may be useful : the principal remedy is, I believe, new, as far as relates to its application to this disease ; and I have much reason to hope, that its utility in the instance I mean to relate to you, may point out a more appropriate treatment than



has hitherto been adopted. The case I propose to detail to you, is one of that form of scrophula which Sauvages calls *scrophula periodica*. He very justly considers it, "maladie singulière," for I believe it is by no means common. This complaint assumes very much of the appearance of *essera*, and like it, too, it is periodical.

Mr. B. of Clifton, has from his infancy been afflicted with decided symptoms of scrophula, which, strange to say, having been more than once mistaken for those of syphilis, had been much aggravated by mercurials. Some months prior to the month of April, 1810, when I was requested to give my advice, the disease had taken the periodical type. Generally, at 5 P. M. his thighs began to swell, with excessive pain from the groin to the knee, and more especially, with acute feeling in the joint of the knee, and with a deep red flush. About 8 P. M. the whole of this surface struck out in large tumours or lumps, each of the size of a small bean. The limbs became motionless from pain and tension; and he now found himself obliged to go to bed. As he became warm in bed, these symptoms abated; and at length towards morning, a sweat breaking out, they yielded altogether. Pain, tension, redness, swelling, and eruption disappeared, and left him apparently free from disease. The paroxysm was always preceded by shivering. An eminent surgeon of Bristol had attended the patient after the commencement of the periodical type of the disease, and had very judiciously ordered muriate of lime in a decoction of the bark. I was called to consult with this gentleman, and seeing the propriety of the remedy, recommended the continuance of it. No change, however, took place; on the contrary, the paroxysms became more violent, in so much as completely to disable the patient

from attending to his business, that of music teaching. I was again sent for ; and now seeing clearly the intermittent form the disease had taken, I determined on putting him on a course of the arsenical solution. He began with doses of 12 drops thrice in the day. Before the expiration of a week the disease was removed. But the medicine affecting his stomach and bowels, I made him desist from it, and directed a smart purge to carry off the arsenic that might have accumulated. In a few days the disease again returned with the same symptoms and form ; and now I directed the solution to be taken in doses of eight and ten drops thrice in the day. This agreed and produced the effect permanently, for now (November) he is in perfect health, having had no return of the disease since May, and following his business assiduously, thanking God for the wonderful relief he has vouchsafed him. The constitutional symptoms of scrophula in this patient, were swellings of the submaxillary glands, inflammation of the tarsi, &c.

You will remark the circumstances in which this case differs from the description given by Sauvages. Here the disease was confined to the thighs exclusively ; with him, *tumores carnosí dolentes, quandoque rubri, plurimi, in diversis partibus, facie, v. g. pudendis, a pisi magnitudine ad magnitudinem nucis intra aliquot dies excrescunt : omnino resolvuntur, suo tempore redituri sine ullo alio incommodo.* The periodical type had commenced only a few months before I saw him, although scrophula had been a constitutional disease from infancy ; with Sauvages, *hoc autem malum plures annos perseverat.* In this patient, mercury had aggravated the disease ; muriate of lime and bark were of no use ; and at length arsenic

had completely cured it. On the authority of Dr. Petit, Sauvages says, *sine suspicione syphilidis sanatum fuit ope hydrargyroscoos frustra tentatis antea diversis remediis*. He calls it a species of farcy peculiar to men; and perhaps it is. How far arsenic may be an applicable remedy to scrophula, in its more usual forms, I shall not take upon me to say. Viewed in its true quality, as a most powerful and the most *diffusible* tonic we are possessed of, its applicability seems, at least, reasonable.

This opinion I have not as yet put to the test of experience, but it is my intention. That it is an effectual remedy when scrophula assumes an intermittent form, is evinced by fact and by analogy. It strikes me that the glandular disease, as it has been called by Dr. Hendy, of Barbadoes, Antigua, and other tropical countries, is so far of a scrophulous nature, as to have for its basis, weak glandular action, and for its type, a series of symptoms nearly similar to that of *scrophula periodica*. When I had opportunity to treat this disease, I had not this view of it, but were it ever to come under my notice again, I think I should be induced to make use of arsenic in it. When I say that I have not employed arsenic in the more usual form of scrophula, I should have added, only in a very few instances; one indeed has been cured, the child of Mr. B., the subject of the foregoing case: in this many parts of the surface were covered with large scrophulous ulcers, and in others there were untractable tumours; a course of the arsenical solution, from three to six drops, thrice in the day, produced a most complete change of ideosyncrasy; the ulcers healed, and the tumours were discussed. This case, at least, holds out encouragement, although the arsenic often, very unplea-



santly, affects the stomach, bowels, and head ; yet this effect is only momentary, and should not discourage, for it is removed by a short interruption of the cause, and one or two saline purgatives. I dwell the more on this probability of successful result, because in no case have I experienced beneficial action, often total inertness, indeed, from the remedies usually resorted to in scrophula. Will any man tell me, that the muriate of lime is permanently curative ? I can safely aver I have not had that good fortune. Much the same may be said of the carbonate of iron and peruvian bark : all these are prescribed, because the physician must do something, and unfortunately knows none better. The muriate of lime, although productive of little or no advantage in the disease to which Dr. Beddoes thought it peculiarly applicable, yet is certainly very useful as a preventive in that most perverse and unmanageable of diseases, gout. I have, for the sake of convenience to the patient, more especially, and partly for the sake of an eligible combination, given the muriate in the crystalized state, united with soap and crumb of bread, the last as a medium of agglutination, without which the two former will not remain in union. Six or ten grains of the muriate thus combined, daily, for several months, have certainly kept off the gout ; whether by producing new habits in the system ; whether by preventing deposition of the residuum of arthritic matter after the subsidence of an attack, and throwing it off by the kidneys or the skin, or whether by having a stronger affinity to some one of the principles of arthritic matter, producing a decomposition, and consequently inactivity, or annihilation of that matter, I leave to the decision of speculative, and chymical physicians. I satisfy myself with the fact ; *in a very limited experience, however.*

A gentleman now in Clifton is a remarkable instance of the preventive power of this medicine, for a year has elapsed since his last attack, and during that time he has assiduously used pills formed of the ingredients I have specified. If we admit the identity of arthritic and uric acid, or to avoid misconception, of arthritic matter and urinary calculus, and we have powerful reasons to do so, from analogy in the effect of alkalies in both, and from chemical analysis, I say, if we admit this identity, then we shall have solid ground to hope that muriate of lime and soap combined, will furnish a pretty certain means of preventing the disposition to the formation of arthritic matter in gouty people, or of removing the disease, providing the mode of life is such as to give additional efficacy to medicine. But holding in view this identity of principle in arthritic and uric matter, I think, from some late trials I have made, that we possess a still more powerful means of preventing their formation, in magnesia. You have, doubtless, read Mr. Brande's very valuable paper "on the effects of magnesia, in preventing an increased formation of uric acid." *Phil. Trans.* 1810. p. 1. The reason which induced Mr. Brande to adopt this substance in preference to any other, was its insolubility in water, and the probability thence furnished of its remaining in the stomach until it should combine with any acid, or be carried along with the food towards the pylorus. The muriate of lime, you will perceive from this just cause of preference, is objectionable, for it is extremely soluble, even exposed to the moisture of the atmosphere. The report of the united experience of Mr. Home and Mr. Brande, contained in the paper adverted to, is so very favourable, and offers so many proofs of complete efficacy, as to have induced me, within the last month, to prescribe magnesia in cases of nephritis, where-

in, until then, I had always been in the habit of giving exsiccated soda and soap in pills, generally, indeed, with very good success; but then that success was the result of long and large exhibition. In one case, a gentleman at Bath, who came over here to consult me for chronic hepatitis, joined to profuse deposition of uric acid in his urine, attended with the usual symptoms of diseased action in the kidneys; together with the appropriate means for the removal of the former, I directed draughts of gentian infusion, and twelve grains of magnesia, thrice in the day, for the latter. In a week, the uric acid completely vanished.—In another case of pure nephritis, the quantity of uric acid deposited was astonishing. He used for some time, the subcarb. sodæ exsicc. and soap, by my direction, even to the extent of nine pills in the day, and apparently with good effect; the uric acid ceased. The pills were discontinued for a very few days, and it appeared as abundant as ever. A second trial had not the same effect: towards the end of February, he reluctantly took the magnesia ten grains, three times a day, in water. In less than a week the uric acid disappeared, and he is now pursuing the course to render the effect permanent. All the nephritic pains, &c. have gone.

Are we furnished with any prospect of the utility of this medicine in diabetes? Probably the disease depends on a morbid state of the gastric glands, i. e. the glands whose office it is to secrete the gastric liquor, and of the kidneys, singly or jointly. Do those states of these organs give rise to the formation of uric acid? Probably they do, of a peculiar species of it. If they do, magnesia will remove the disease. Little benefit has resulted from the use of the usual remedies, and although my recommendation of this is merely perspective, and bordering on the confines of spe-



ulation, yet it is, I imagine, far from being unreasonable ; for good may arise, without the possible production of evil.

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## VI.

OBSERVATIONS *on* CANINE MADNESS, *originally addressed to a friend in Boston, by* JAMES THACHER, M. D. *of Plymouth. Communicated to* Dr. DAVID HOSACK, *by* Dr. B. LYNDE OLIVER, *of Salem.*

Plymouth, December 10, 1810.

DEAR SIR,

THE prevalence of canine madness has justly excited uncommon interest and alarm in this vicinity, the present season. The human system cannot be affected with a malady more truly deplorable in its nature, and dreadful in its consequences, nor can the virtues of humanity and benevolence be more honourably displayed, than in contributing to the relief or prevention of such afflicting calamity. Two melancholy cases of hydrophobia have recently fallen under my observation in the town of Duxbury. A son of Mr. Silvanus Weston, aged three years and eight months, and Mr. Ezra Silvester, aged seventy-three years, were both bitten by the same dog on the 16th August last. The unfortunate child was so furiously attacked, that he received thirty-one wounds in various parts of his body, before his mother could rescue him from the jaws of the animal. By the direction of a physician, a mercurial course was immediately commenced, and persisted in to the point of ptyalism, for thirty or forty days, and one of the wounds intentionally kept in a state

of ulceration about three weeks. Notwithstanding this procedure, however, on the 28th of October, seventy-three days from the injury, the child was seized with the symptoms of fever, with severe pain, particularly in those parts where the wounds had been inflicted, and these precursory symptoms were soon succeeded by hydrophobia, with wild delirium. When water, or other liquids were presented to him, he eagerly grasped the cup with both his hands, and with great agitation carried it to his mouth, by which a convulsive suffocating sensation was instantly excited. Terrified at every object, the most distressful apprehensions and anxiety were depicted on his countenance, and manifested by his unnatural actions and gestures, throwing his body about in every direction, and making the most hideous efforts to fight, and to bite his mother, and all within his reach. Imagining the dog in every part of the room, he darted his eyes continually around, and intreated to have the animal driven from his presence. When I was first called to visit him, 3d November, the 6th day of the disease, his skin was remarkably livid, and his extremities cold; the pulse imperceptible at the wrist, but strongly marked at the carotid arteries. In less than three hours after my arrival his countenance assumed the image of death, and I could only witness the painful scene, and the fatal termination which ensued. This may be enumerated among the instances on record, of the inefficacy of a mercurial course as a preventive remedy.

The fate of Silvester, who had received only a single bite on one of his fingers, was protracted to a later period. His health was not interrupted until the 14th of November, and in two days after symptoms characteristic of hydrophobia supervened. Unconscious, however, of his

hazardous situation, and unaccountably solicitous to conceal every appearance of indisposition, my attendance was not requested until six days had elapsed. On my arrival, the most unequivocal marks of the hydrophobia were recognized; a spasmodic affection when water was presented to his view, and a painful suffocating sensation attended every attempt to swallow liquids. The lungs and muscles pertaining to respiration were singularly affected: as if combining their powers to obviate the approach of the obnoxious fluid, they exhibited alternate emotions similar to those induced by immersing the body suddenly into cold water. His eyes were inflamed, his strength greatly prostrated, his extremities cold and livid, his pulse reduced to fifty-two in a minute, and extremely irregular. These palpable indications of approaching death were realized at eleven o'clock, A. M. on the 21st November.

The Rev. Dr. M. Cutler, of Hamilton, prompted by the most benevolent views, procured and communicated to me, a well authenticated statement of a remarkable case of hydrophobia, in which a radical cure was effected by the use of *lobelia inflata*. Encouraged by this instance of success, and apprised of the inadequate powers of every other remedy, I was prepared to give a trial to its virtues whenever opportunity should occur. Although the debilitated and desperate condition of Silvester precluded the possibility of a decisive experiment, I was induced during my attendance of twenty-six hours, to administer several doses of the saturated tincture of *lobelia* at proper intervals. The second dose excited nausea and puking, and evinced the palliative tendency of the medicine. A diminution of the severity of the hydrophobic symptoms was clearly demonstrated in the pre-



sence of numerous spectators; nor did their violence again recur. He slept quietly the whole of the ensuing night, and in the morning an increase of vigor in the system was observable, and his pulse was 73 in a minute. Liquids now produced little or no abhorrence, and he could afterwards swallow with facility. The active and stimulating properties of lobelia are well ascertained, but its specific efficacy as a remedy in hydrophobia is yet to be determined by the test of experiments, under the observation of prudent and intelligent physicians.

The *scutellaria galericulata*, or scull-cap, another native production, is reputed to have effected numerous cures both among the human species and brute creation. The character and description of this plant, with all the authority in its favour which could be procured, has been introduced to the public by the suggestion of the respectable clergyman above mentioned, through the medium of the American New Dispensatory. One instance, however, has recently occurred in this vicinity, confirmatory at least of its probable utility. A cow, severely bitten, has been preserved by its use, while other animals poisoned by the same dog, became mad and died. The plant is, I believe, produced plentifully in our low meadows, particularly on the banks of rivers and ponds. It flowers in July or August, when it should be carefully preserved, and our farmers may with a fair prospect of success, have recourse to it as a remedy among their cattle when unfortunately bitten. As no deleterious properties have been ascribed to this article, medical skill is not requisite in its administration, and no one should hesitate to employ it with all the confidence which its high character thus far is calculated to inspire.

It is extremely important that the medical virtues of this domestic remedy should be brought to the test, and the result of every experiment ought to be promptly promulgated, that its real merit may be actually decided.

That the fatal consequences of the ravaging evil in question, may, as far as possible, be obviated, it is incumbent upon professional men, to direct their attention to the most eligible means of prevention on such alarming occasions. The first in point of importance or security, unquestionably is, the operation of cutting out or burning the parts in which the bite has been effected ; but whether this be dispensed with or not, a careful and assiduous ablation cannot be too strongly inculcated. If the wounded part be properly scarified within a few hours, or even days, after the accident, and water be poured on forcibly, and the washing persevered in for a length of time, there is almost an infallible certainty, that in general the destructive poison may be completely eradicated before it can be absorbed into the system. The above process, however, should, for greater security, be followed by the application of the nitrate of silver, or some other caustic in solution, or if not speedily attainable, a valuable substitute may probably be found in the properties of strong unslacked lime. I subscribe myself, with great respect, Sir, your obedient humble servant,

JAMES THACHER.

VII.

*Observations on various Remedies in the Treatment of HYDROPHOBIA: extracted from a Letter addressed to Dr. B. LYNDE OLIVER, of Massachusetts, by DAVID HOSACK, M. D. Professor of Botany, &c.*

New-York, February 10th, 1811.

DEAR SIR,

Your several letters of December, January, and of the 5th of February, have been duly received. I have delayed answering them, for the purpose of obtaining and communicating to you a paper on the use of the *anagallis arvensis* in hydrophobia, which I have at length procured. This plant is a native of your state, as I know, having myself met with it when passing through Massachusetts and Connecticut, some years since. But this can be of little importance, at this time, to those who may now be the subjects of that terrible and fatal disease, as that plant is the product of the summer season.

I received the observations of Dr. Thacher, and intend to print them as a valuable document, in the next number of the Register. But as to the *lobelia inflata*, the *anagallis arvensis*, or the *scutellaria*, I confess I have seen no evidence sufficient to give confidence in either of them as antidotes to that most deadly disease. Mr. Coleman, however, tells me that in the neighbourhood of Mamaroneck, he has certainly witnessed the good effects of the *scutellaria*: the information he possesses, has been already made public through the medium of the Evening Post.



The scutellaria of our country, is not the species *galericulata*, but the *lateriflora*; see Willdenow or Persoon. I mention this not from an examination of the living plant, but from a reference to the plates of Curtis, Smith, and Vahl, who represent the *galericulata* to have axillary flowers and large corollæ; whereas the *lateriflora*, and which corresponds with our plant, has small flowers, and those in a racemus, intermixed with small leaves. I shall in future attend to these particulars in the living plant. I also receive the same information from my nephew, Dr. Eddy, a young but accurate botanist.

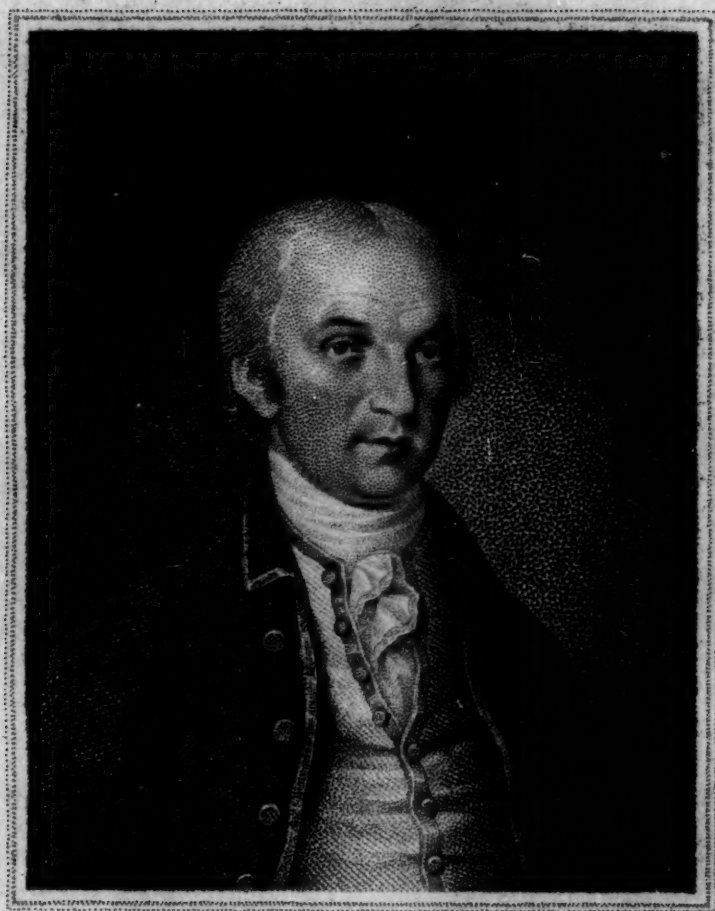
The remedy, which of all others I should be inclined to try upon any patient of mine, is that of Crous, purchased sometime since by the state of New-York. You know that excepting the calomel, its chief ingredient is copper: all the other accompaniments I consider as so much quackery. But in the use of copper I confide, because it is among the most active articles of the materia medica, as we see in epilepsy, and many other diseases of the nervous system, in which it has been successfully administered: add to this, that the evidence upon which Crous' remedy was purchased was very respectable, as I have been informed personally, by governor Lewis. Analogy also sanctions the principle, that nothing short of an active medicine, or poison if you please, can prove the antidote to that of hydrophobia. In a case of *tetanus*, (see the Annals of Medicine and Medical Repository,) I gave three gallons of Madeira wine, in a short space of time, without producing any apparent excitement while the irritations of the disease continued: but the moment the latter ceased the wine began to produce exhilarating effects. I then ceased to give it; she had no returns of the complaint. A

little patient of mine, some years since, was bitten by a mad dog in the arm ; hydrophobia came on in a few days with all its characteristic symptoms. I resolved to try opium ; she was about five years of age. I gave it in every possible form : as much as two grains of solid opium were given every two hours. I also directed laudanum, in glyster, and applied a plaster of opium to the throat ; but all to no purpose in counteracting the irritation of the disease. Nor had she a moment of sleep in three days and as many nights, the time she lived after hydrophobia first appeared, but sat up in bed until the moment of her dissolution. As the stimulus of wine has counteracted lock jaw, and as the sedative effects of opium, (as far as it has been tried in this case,) will not controul the irritation of hydrophobia, let us try what the powerful stimulus of the oxyd of copper will do. Was I, myself, the subject of the disease, Mr. Crous' remedy should be tried as far as the copper is concerned.

We surely could not take into our system so much of this metal, and in the manner administered, without evil consequences when in health. I therefore conclude that the one irritation is expended in counteracting the other. Let us then not despair of administering some stimulus calculated to arrest that of hydrophobia ; the volatile alkali certainly allays the irritations produced by the bite of the viper. As a preventive, I confide most in washing the part, as recommended by Dr. Thacher, and continuing the process a considerable length of time. The little girl, before mentioned, was bitten on the arm about 7 o'clock in the morning ; in less than fifteen minutes after the accident, I removed not only all the parts bitten, but to a considerable distance beyond them, so as to em-







*Leary sc.*

DR. JOHN COCHRAN

brace every possible point to which the teeth of the animal could have extended. In a very few days the disease appeared.

About an hour after, a man, who had been bitten by the same dog, and in a few minutes after the little girl met with the accident, called upon me. He was bitten on the outside of the leg, a few inches below the knee ; so long time having elapsed, I concluded to make use of washing. I took him into the yard, where my pupils, in turn, continued to pump fresh well water upon the bitten part, at least for the space of an hour : he escaped the disease.

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## VIII.

BIOGRAPHICAL MEMOIR *of the late Dr. JOHN COCHRAN :*  
*Communicated for the American Medical and Philo-*  
*sophical Register.*

*With an Engraving, from an Original Painting.*

THIS gentleman was born on the first of September, 1730, in Chester county, in the state of Pennsylvania. His father, James Cochran, was a respectable farmer, who had come from the north of Ireland, and the lands which he first purchased still continue in the possession of his descendants. Discovering in his son John the desire of a learned profession, he sent him to a grammar school in the vicinity, that was taught by the late Dr. Francis Allison, who was confessedly one of the most correct and faithful grammarians that ever taught in this country. Having finished his preliminary education, Mr. Cochran betook

himself to the study of physic and surgery under the late Dr. Thompson, in Lancaster. Under this gentleman he improved greatly, by his diligence and attention, in the knowledge of his profession. About the time at which he finished his medical studies, the war of 1755 commenced in America between England and France. The army then presented to the mind of Dr. Cochran a scene of usefulness and further improvement. As there were not any great hospitals at that time in the provinces, he readily perceived that the army would be an excellent school for his improvment, especially in surgery, as well as in the treatment of many diseases. He soon obtained the appointment of surgeon's mate in the hospital department; and continuing with the northern army during the whole of that war, enjoying, as he did, the friendship and advice of Dr. Monro, and other eminent surgeons and physicians, he quitted the service with the character of an able and experienced practitioner.

At the close of the war, he settled in Albany, where he married Mrs. Gertrude Schuyler, the only sister of the late general Schuyler. From that city he removed in a short time to New-Brunswick, in the state of New-Jersey, where he continued to practise physic and surgery with great reputation. In discharging the duties of his profession, he bestowed that attention, and exercised that tenderness and humanity, which never fail to solace the feelings of the afflicted.

When the war became serious between Great-Britain and the United States, Dr. Cochran was too zealous a whig, and too much attached to the interests of his native country, to remain an idle spectator. Towards the



last of the year 1776, he offered his service as a volunteer in the hospital department. General Washington was too good a judge not to discover the value of a physician who joined great experience to diligence, fidelity, and a sound judgment, and accordingly, in the winter of 1777, he recommended him to congress in the following words : " I would take the liberty of mentioning a gentleman who I think highly deserving of notice, not only on account of his abilities, but for the very great assistance which he has afforded in the course of this winter, merely in the nature of a volunteer. This gentleman is Dr. John Cochran, well known to all the faculty. The place for which he is well fitted, and which would be most agreeable to him, is surgeon general of the middle department ; in this line he served all the last war in the British service, and has distinguished himself this winter, particularly in his attention to the small pox patients and the wounded." He was accordingly appointed on the 10th of April, 1777, physician and surgeon general in the middle department. In the month of October, 1781, congress was pleased to give him the appointment of director general of the hospitals of the United States, an appointment that was the more honourable, because it was not solicited by him. It is hardly necessary to observe, that the doctor was much indebted to his observation and experience while he was in the British service, for the great improvements he made in the hospital department, from the time it was put under his care. Nor is it necessary to observe, that while other gentlemen, high in the medical staff, were disgusting the public with mutual charges and criminations, Dr. Cochran always preserved the character of an able physician and an honest man.

A short time after the peace, Dr. Cochran removed with his family to New-York, where he attended to the duties of his profession until the adoption of the new constitution, when his friend, president Washington, retaining, to use in his own words, "a cheerful recollection of his past services," nominated him to the office of commissioner of loans for the state of New-York. This office he held until a paralytic stroke disabled him in some measure from the discharge of its duties, upon which he gave in his resignation, and retired to Palatine, in the county of Montgomery, where he terminated a long and useful life, on the 6th of April, 1807, in the 77th year of his age.

In reviewing the character of this respectable physician, we have only to remark, that without the flights of imagination which tempt some gentlemen to theorise and speculate at the risk of their patients, he united a vigorous mind and correct judgment, with information derived and improved from long experience and faithful habits of attention to the duties of his profession.

He had in early life received impressions, under the care of a religious father, which he never lost; for though he served long in the army, in which men are too apt to become infidels or deists, he never cherished a single doubt concerning the truths of revelation.

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## REVIEW.

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ART. I. TRAVELS *on an inland Voyage through the states of New-York, Pennsylvania, Virginia, Ohio, Kentucky, and Tennessee, and through the territories of Indiana, Louisiana, Mississippi, and New-Orleans ; performed in the years 1807 and 1808 ; including a tour of nearly six thousand miles. With maps and plates.* By CHRISTIAN SCHULTZ, jun. Esq. New-York. I. Riley. 1810. 8vo. vol. 1. pp. 207. vol. 2. pp. 224.

THIS book of travels differs very much from the numerous effusions that we have read of travellers through the United States. It does not contain, that we have discovered, a single sentence that is marked by abuse of the soil, climate, or inhabitants. Hitherto we have been accustomed, when we opened a volume of travels in the United States, not to expect information concerning the inhabitants, their laws and customs, their arts and manufactures, nor any thing that would make us acquainted with the people ; but we read those travels, when we have the patience to read, merely to discover the talents of the several writers in drawing caricatures, or to observe the various shapes into which hatred, envy, or the hope of reward, can distort the truth.

While the United States retained the humble name of provinces, North America was deemed to be a country in which the human race might not only subsist and vegetate, but might progress and prosper. In this persuasion,



people came over in crowds from England, Ireland, Scotland, and Germany ; nor was it said or intimated by any philanthropic writer, so far as we can recollect, that those people were in danger of perishing by the want of food, or the diseases of the climate. It was then thought to be a country in which the industrious man could make a comfortable provision for his family, though he had been oppressed by heavy rents, taxes, and poverty in his native land. No sooner, however, had those states drawn the attention of Europe by a vigorous war, in which they secured their independence, than they were assailed by a herd of scribbler. Every mercenary pen was pointed against us, and the nation, that had not been conquered by the sword, was then to be prostrated by the quill. It is a curious circumstance, that the business of writing pasquinades against the United States, should be adopted, as a profitable employment, by subjects of France as well as of Great Britain. The duke de Liancourt's travels, which contain nearly as many deviations from truth, as they do sheets of paper, are said to have brought him about one thousand guineas. But the proverb may plead his excuse, "*il faut manger.*"

The unfortunate farmer Parkinson, who found that a man cannot support himself upon a farm in Virginia ; and the other unfortunate adventurer, Jansen, who, like the bookseller's bookmaker of London, calls himself a *stranger* in the country of which he writes, and several other "*dii minorum gentium,*" are equally beneath contempt and criticism. The Irish traveller, Weld, has written the *best book*, as we understand ; for it procured him an office under the government. His book was considered so valuable, that a pamphlet, containing extracts

from the most abusive parts of it, was distributed gratis through the seaport towns in Ireland. This fortunate, writer, but very unfortunate traveller, gives us to understand, that he seldom entered a farmer's house in the United States where the people had any thing to eat. He does not, indeed, seem to think that the farmers of the United States live, like cameleons, upon air; but if he was asked, how it happens that Britain, Ireland, Spain, and Portugal, are occasionally supplied, from this country, with provisions, he would account for it, we suppose, by saying that our farmers live upon nothing.

The true object of Weld's book is, to prevent emigration from his native country. Would it not be more honourable in Great Britain to prevent emigration by an act of parliament, than by hiring people to publish libels? By the way, we conceive that a law to prevent emigration would be perfectly correct, at a period when that nation is contending for her very existence with all the continent of Europe. Certain it is, that the wishes of the British government, and of every real friend of this country, are perfectly alike on the subject of emigration. Mr. Jefferson, in his Notes on Virginia, speaking on this subject, expressed his purest political sentiments. Stating his objections to the importation of foreigners, he mentions the purity of our political principles, and says, "to these nothing can be more opposed than the maxims of absolute monarchies, yet from such we are to expect the greatest number of emigrants. They will bring with them the principles of the governments they have imbibed in early youth, or if able to throw them off, it will be in exchange for an *unbounded licentiousness*, passing, as is usual, from one extreme to another." Most of us know whether this prediction has been verified.

Mr. Schultz has been at a considerable expense in giving maps of the interior of the United States, and the man, who is not well versed in American geography, may acquire considerable information on that subject, by consulting them. He is a sprightly writer, and does not seem to have travelled in a bad temper. He has been more correct than most of his predecessors, in describing the falls of Niagara; but when he was on that ground, we heartily wish that he had relinquished the expectation of destroying the Mosaic history of man, and with it, divine revelation. Although many pop-guns in the United States have lately been fired against that fortress, we deem it certain that the period has not arrived when the avowed contempt of revelation can be accounted the criterion by which political opinions are to be tested. That the reader may understand the argument to which we refer, he is to recollect that there must have been a time, in which lake Erie and lake Ontario were nearly on a level, but by some convulsion of nature, a perpendicular fissure was made in the earth, and lake Ontario, with the adjacent country, was sunk between three and four hundred feet.

The fissure was a little above where Queen's town now stands. In that case, the falls of the river Niagara began at the edge of the fissure, but they have, by the constant operation of the water, been wearing away the bank, and have advanced up the river about seven miles and a half. How many years would it require, (Mr. Schultz puts the question,) how many years would it require, for the river Niagara to wear its way through a solid rock, seven miles and a half? He observes, that the river has been known by civilized men about 140 years, in which



time, it is not believed that the falls have advanced at the rate of eighteen inches in the year. At which rate they would have required at least twenty-seven thousand years to have advanced from the edge of the chasm: a proof that Moses was mistaken. Now, the whole of this argument is founded upon the supposition that all the great rocks, that now exist in the earth, had their existence above four thousand years ago; a supposition that is absolutely unfounded and false. Every man who is versed in natural history, knows that many vast rocks are not coeval with the earth. Animal and vegetable substances are frequently found in the midst of great and solid rocks, a proof that such rocks are of modern formation. But a man may be an observant traveller, without being well versed in theology, or natural history. Mr. Schultz does not, like many travellers, speak of improbable things,

“Of cannibals that each other eat.”

But in sundry places he seems to have suffered under

“Moving accidents by flood and field.”

It is not, indeed, to be presumed that every reader will find himself so much interested in the fate of the traveller, as to be distressed on his account whenever he chances to stumble into a slough; but when he sees him rise, like Smedley, “in majesty of mud,” he cannot help feeling for him. Speaking of a ride from Presque Isle to Fort le Bœuf, vol. I. p. 110, he says, “what think you of starting at sun rise at this season of the year, when the days are longest, and making it dark night, before you could whip and spur through fourteen miles of mud and mire? a great part of which is up to your knees while sitting on the saddle. No doubt you have seen people treading clay for making bricks. Had you seen me at the time of my arrival at this place, you would

have sworn that man and horse were both brick makers, for both were literally covered at least one half inch thick, with mud from head to foot." This was confessedly a very grievous beluting, but the perils of this ride were trifles, when compared to what he suffered on a subsequent excursion. Riding in a dark night about the last of September, near the river Ohio, and having wandered from road and path, his horse slipped down a steep bank into a small river. He could not climb the bank, but there he sat, up to his horse's knees in water near an hour, listening to the tremendous howlings of a pack of wolves, who doubtless had some thoughts of eating him. What was to be done? He was not a pilot for that river, but he fairly concluded that drowning was less terrible than being devoured by wild beasts, therefore he advanced up the river, but before he had gone one hundred yards, his horse plunged over head and ears into a fathomless pool. How they got out, neither of them has told us very circumstantially. Vol. I. p. 162.

Mr. Schultz has been sufficiently minute in detailing the expenses of travelling the whole distance, from New-York to New-Orleans, by way of Albany and the great lakes; but as we do not conceive that many of our readers have thoughts of travelling by the same route, we shall not transcribe his account of them. It appears nevertheless, from his journal, that merchandise can be carried from New-York, by the way of Albany and the lakes, to the waters of the river Ohio, cheaper than they can be carried by land from Philadelphia; a circumstance that deserves public attention. If we accompany Mr. Schultz on his voyage down the Ohio, to the river Mississippi, up the Mississippi to the mouth of the Missouri, and thence to the city of New Orleans; if we attend to the

various accidents and disasters that await the traveller on the Mississippi, from sawyers, sleeping sawyers, planters, falling banks, wooden islands, floating islands, snags, &c. we shall admit that the navigation of that great river must ever be attended by great loss or delay. We shall also admit that no time should be lost in finishing the great canal, that has lately been projected between lake Erie and Hudson river. By the means of which canal peltry and furs may be brought to this city cheaper than they can be carried by the channel of the Mississippi. If the reader wishes to have more information on the subject of that canal, he is referred to an essay in our second number, signed an Observer, and to another in our third number, signed Mercator.

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ART. II. *ADDITIONAL FACTS and OBSERVATIONS relative to the Nature and Origin of the PESTILENTIAL FEVER. By the College of Physicians of Philadelphia.* Philadelphia. Dobson. 1806. 8vo. pp. 99.

WE have already taken notice of the opinions of the College of Physicians relative to the peculiar nature of the yellow fever, and presented an abstract of some of the more important facts contained in their first publication on this subject. It will be sufficient, therefore, at the present time to state, that the observations and experience of the college, subsequent to the publication of the former part of this work, have afforded still farther evidence of the correctness of the opinions originally declared by them, and that this evidence is now given to the public in a plain and highly perspicuous manner, unincumbered with conjecture or hypothesis ; and, for our own part, we



do not hesitate to add, is grounded on such respectable testimony, and is of such a nature, as to challenge refutation. As the introduction affords a satisfactory explanation of the nature of the work, and of the motives for publication, we shall insert it entire, and afterwards briefly notice the several articles which constitute the volume.

“ On the re-appearance of the pestilential fever in this city in 1793, after an interval of more than thirty years, we were struck with its mortality and contagious nature, as well as with the train of symptoms, so widely different from any thing we had been accustomed to. These considerations naturally produced a supposition of its foreign origin; and in the course of our inquiries on the subject, we were led to make the following conclusion, in reply to the requisition of the governor of the commonwealth on the origin of the disease.

“ ‘No instance has ever occurred, of the disease called the yellow fever being generated in this city, or in any other part of this state, as far as we know; but there have been frequent instances of its having been imported, not only into this, but into other parts of North America, and prevailing there for a certain period of time; and from the rise, progress and nature of the malignant fever, which began to prevail here about the beginning of last August, and extended itself gradually over a great part of the city, we are of opinion, that this disease was imported into Philadelphia by some of the vessels which arrived in the port after the middle of July. This opinion we are further confirmed in by the various accounts we have received from the best authorities we could procure on the subject.’

“ Subsequent events and researches have confirmed these opinions; and in 1798, when the facility of producing sufficient proofs was abundant, we published an account of the nature and origin of the pestilential fever, accompanied with such facts to prove its introduction into this city from the West Indies as to us appeared incontrovertible. The mode of introduction and of the spreading of this disease, beginning as from a point, and gradually extending itself more or less throughout the city, as well as the daily instances of its

communication which occurred, had also, as we supposed, afforded evidence, sufficiently convictive, of its contagious nature.

"In order, however, to throw more light on the subject, we conceive it may be useful to publish the opinions and observations of several respectable characters, physicians and others, concerning the sentiments long since prevalent in this country, as well as some interesting facts, which had come to their knowledge respecting the foreign origin of the disease.

"The importation and contagious nature of this fever appear to be so closely connected, that in addition to what has been repeatedly published on this head, we have selected a few cases, which we suppose must very clearly prove the contagion of the pestilential fever, more particularly during the months of July, August, September and October.

"A desire to be useful to our country, by calling the public attention to these important points, so as to prevent any relaxation in quarantine laws, as well as to disseminate truth generally for the good of others, has been our motive for making a further publication at this time; for we think there is too much reason to fear that the partial exemption from these diseases of later years, may have a tendency to produce a dangerous security amongst us."

The first article is a letter from James Pemberton, Esq. an old and respectable inhabitant of Philadelphia, which contains many interesting facts relative to the introduction of the yellow fever into this country above a century ago, and at several subsequent periods. It appears from this letter, that the yellow fever was imported into Philadelphia in 1699, in a ship from the island of Barbadoes, and that it spread through the city, and was attended "with great mortality, fully equal to or exceeding any that has occurred in the same space of time, comparing the then infant state of the city with its population in 1793, or since that period." This fever was not again experienced in Philadelphia until 1740, at which time it

was also received from abroad. For the military expedition of 1739, which was promoted by Great Britain, against some of the Spanish West-India possessions, particularly Carthagena, troops were raised in Pennsylvania, and upon the return of the ships and people employed on this occasion, a new species of fever was introduced. It was not, however, so prevalent, nor did it occasion as much alarm as the fever of 1744, which proved mortal to a number of the inhabitants, and which "was distinguished," says Mr. P. "by the name of yellow fever, and known to be imported from some of the West-India islands." A malignant fever again appeared in 1747, 1760 and in 1762; at this last mentioned time it was attended with such symptoms as baffled the skill of the most experienced physicians.

"Having had the opportunities (says Mr. P.) of knowing the state of our city in respect to the prevailing diseases, from the year 1740, I am confirmed in my opinion, that the malignant and infectious fevers afflicting the inhabitants at various times, have been introduced from foreign parts, and that this was the invariable judgment of my fellow citizens, physicians and others, which I never heard called in question until since the year 1793, when a contrary doctrine was advanced, which I think is as difficult to support by facts, as that the plague which distressed the citizens of London in the year 1665, was a native of the British climate." p. 7, 8.

The second article is a letter to Dr. S. P. Griffitts, from Thomas Willing, Esq. late president of the bank of the United States. It minutely relates the manner in which the yellow fever was brought into Philadelphia, in the year 1747 and 1762. The third letter is from Benjamin Chew, Esq. formerly chief justice of Pennsylvania, and still further corroborates the opinion of the importa-



tion of the disease in 1747. The next communication is a letter to Dr. D. Hosack, from the late Dr. Charlton, a distinguished practitioner of this city. The facts which Dr. C. states tend to establish the distinction between the yellow fever, as a specific disease, and the bilious intermitting and remitting fevers of our country. We shall make a quotation from the doctor's letter.

"I have always considered the yellow fever as a species of disease not indigenous to our climate, but of imported origin with us : and here it may be necessary to remark, that in the year 1795, in consequence of an application from the mayor of the city to the medical society of the state of New-York, of which I had the honour of being president, a committee of that body were directed to consider of and report upon the nature and origin of that fever, which prevailed at the time. The report of the committee was in favour of its domestic origin, and was adopted by the society ; and in my official capacity, I affixed my signature to it, though contrary to my own opinion.

"Among the distinguishing characteristics of this disease, I consider the total absence of remission for the first two or three days ; after which it frequently happens that there will be a regular, slow pulse, apparently free from febrile action, insomuch that the inexperienced are flattered with a prospect of the favourable termination of the disease, while the insidious foe is secretly undermining the fabric, as a few hours fatally evince, by an aggravation of all the symptoms. Another mark of distinction is the dusky hue the surface acquires, instead of the bright orange colour it has in the bilious remittent : the appearance of the tongue and fauces, which are frequently (comparatively) clean to the last, is a peculiarity of this species of fever. I also think that delirium does not supervene so early, as in the jail, hospital, or ship-fever.\* I never met with a case of yellow fever in the country, but which could be clearly traced to have been derived by infection from the city." p. 13, 14.

\* I also consider the black vomit as a symptom peculiar to this disease, having never met with it in any other.

We are next presented with a very interesting letter from Dr. Samuel Bard, President of the College of Physicians and Surgeons in this city, in answer to certain queries proposed to him by Dr. D. Hosack. From the learning and talents which Dr. B. possesses, and from the ample opportunities of observation which a long and extensive practice has afforded him, we are persuaded that his remarks will be read with great interest by all who prefer the decisions of experience, to the suggestions of the imagination.

"In answer to your inquiries: I began to practice medicine in New-York, in the year 1766. — Remitting fevers have since that time prevailed more or less every fall. They frequently were attended with bilious discharges, and yellow skin, and in proportion as these symptoms prevailed, were termed bilious remittents; in some instances these symptoms have run very high, and the accompanying fever in such cases has generally been more ardent and constant; but nevertheless, sensible remissions so generally accompanied them, that they were always looked for; and it is now thought the duty of the physician to watch for them, and by emetics, other evacuations, and blisters to promote them, so as to procure an opportunity to administer the Peruvian bark, by which the cure was generally completed.— Now and then, and particularly during the war, when the city was much crowded, and little attention was paid to cleanliness, fevers of a more malignant nature have prevailed, in which a foul mouth, hæmorrhages, petechial eruptions, and other marks of dissolution have either characterised the disease from its commencement, or been superadded to the bilious symptoms in the latter stages; and then the disease has been termed malignant, putrid, petechial, jail or hospital fever. In such cases I have now and then seen profuse bloody discharges, and black, or as it is now more generally named, coffee-ground vomiting;\* but a more frequent symptom in these fevers, and one I do not remember to have seen in yellow fever, is the aphthous crust with which the mouth and throat is often lined—In these fevers, death seldom occurs, nor is a crisis often to be expected before the

\* Is this of the same nature with the black vomiting of Yellow Fever? I suspect not.

seventh day, and both are frequently protracted to the fourteenth, or even to the twentieth—such were the cases of my sister during the war, and of my son about six years ago, which you have frequently heard me mention. Just before, and what gave occasion to the appointment of the health-officer of New-York, about the year 1758 or '59, a ship crowded with Germans arrived here in a very sickly state, and were put under my father's care. He procured accommodations for the sick at a little distance from town; and I have heard him say, that out of five or six pupils and attendants, he was the only person who escaped the disease. This disease he always called ship or jail fever, but never yellow fever, and it is worthy of observation, that he had seen the yellow fever which prevailed in New-York about the year 1744. Another instance of the same nature occurred whilst I was health-officer, I mean the ship in which Mrs. M'Lean came from Scotland; in which, out of I think about three hundred passengers, upwards of seventy died; but of those I saw no one case in the least resembled yellow fever.

“The first case of fever I ever saw with that assemblage of symptoms we have since denominated yellow fever, was the case of Mr. Jenkins.\* To this I was called in consultation with my father. I found Mr. Jenkins perfectly in his senses, walking about in his chamber, and alternately sitting on his bed, with a handkerchief in his hand, continually wiping the blood which oozed from his mouth and gums, and with a very yellow skin. But what struck me most forcibly was the slowness and regularity of his pulse, insomuch, that upon retiring to another room, I remarked, that notwithstanding the other threatening symptoms, I could not help entertaining the most confident expectation of his recovery: my father, however, immediately checked my hopes by informing me, that this was a case of *yellow fever of the West-Indies*, that he considered the patient in the most imminent danger, and indeed had little or no hopes of his recovery. You know the event, and how soon we were convinced of the correctness of his judgment, both as to the fate of poor Jenkins, and the nature of his complaint.

“Since this we have too frequently had to lament the occurrence of yellow fever, which all the experience I have had has still tended

\* In the year 1795.



to convince me is a disease I never saw before that case of Mr. Jenkins.

“The rapid course of this fever, terminating in death sometimes so early as the second, frequently on the third and fourth, and seldom protracted to the seventh day; the violence and unremitting nature of the symptoms; the discoloration of the skin, which is frequently livid rather than yellow; the hæmorrhages, black vomiting, and above all, the cessation of fever, with the regularly slow pulse, which generally precede death, do in my opinion distinguish it from all others.

“You will perceive that I consider this fever as a distinct idiopathic disease, and not a variety or grade of any other.—I likewise believe it to be a stranger and not a native of our country, and from the best information I have been able to obtain, in every instance of accession imported from abroad.” p. 15—19.

Some extracts from a letter of Dr. Redman to the college of physicians, dated in September, 1790, constitute the next article. They relate to the fever of 1762, and furnish additional circumstances as respects its origin and extension. The seventh article is from Dr. Joseph Bayley, physician at the quarantine establishment of this city, and is in reply to a number of queries proposed to him by Dr. Hosack. In this paper, which is well worthy of an attentive perusal, and which contains many of the leading distinctions between the symptoms of yellow fever and those of the bilious remittent, and also of the peculiar mode of treatment, &c. the following observations occur :

“1st. *Quere.* Do you consider it (the yellow fever,) as differing from typhus fever, and bilious remitting fever, and in what does it differ from those fevers ?

“*A.* It differs from typhus in the rapidity of its progress through its different stages, and the irritability of the stomach. Bilious re-

mitting fever is a milder disease of longer duration ; the yellowness of the body is an invariable attendant, and comes on at the beginning ; but that discoloration of the skin which frequently accompanies yellow fever comes on later, and is of a dusky yellow or orange colour, readily distinguished from the yellowness of bilious fever ; the matter vomited in bilious fever is always bilious, from a bright yellow to a dark green." p. 23.

" 2d Q. Have you ever seen the yellow fever on board of vessels arriving from our southern states, or what are the symptoms which are usually met with in the fevers on board those vessels ?

" A. When the yellow fever rages in any of those states, persons ill with this disease arrive in vessels. But this is not the case when the yellow fever is not epidemic ; but bilious remitting fever and intermitting fever are the usual diseases received at the marine hospital from coasting vessels, in the months of July, August, September and October.

" 3d Q. Have you ever seen a fever with black vomit, orange-coloured skin, and terminating fatally within seven days, on board of the Irish ships crowded with passengers ? Is a fever of this sort frequently met with ? Or does it usually assume the characters of the typhus fever, i. e. jail or hospital fever arising from confined human effluvia ?

" A. Among the greater number of sick Irish emigrants that arrived here in the year 1801, I have seen four cases of yellow fever, that have terminated in black vomit (of the colour of very weak coffee, with black mucous particles floating in it) on the seventh or eighth day of the disease. Their eyes were inflamed and protruded ; the skin began to change after the third or fourth day, and before death, was universally of an orange colour ; but there was not that nausea and vomiting at the beginning as in yellow fever." p. 23, 24.

" 6th Q. If you have ever seen a vomiting of black matter in the passengers of Irish ships, did it occur on ship board, or after their removal to the hospital on shore ? Did the matter vomited resemble coffee grounds, or did it appear in the form of flakes, or was it merely of a dirty brown colour ?

"A. The hospital being crowded by an unusual number of sick, temporary sheds were put up, and tents pitched for their reception. The four cases of black vomit (as described under the third answer) that occurred among the Irish emigrants were under the sheds or tents." p. 25.

"13th Q. Have you not frequently remarked that the crew of a vessel became unhealthy immediately upon breaking bulk, whereas at sea they had been in good health; has this frequently been the case when they came from a healthy port, or was it invariably found, where they thus became seized with fevers upon opening the vessel, that they had come from an unhealthy port?"

"A. Several vessels have arrived at this port, that have lost part of their crews in the West-Indies; and some sick at the time of their sailing, who either recovered or died before the arrival of the vessel in this port, at which time the remaining seamen were healthy, and no sickness on board for ten or twenty days; but when those same seamen were engaged in discharging the cargo, some of them sickened and died of yellow fever. This pent-up air of the hold was no doubt similar to that in the unhealthy port from which they came, and to which their shipmates fell a sacrifice in the West-Indies. The ship General Wayne, which arrived here in the year 1799, is a memorable, as well as a fatal case to illustrate this fact: on her arrival one of her seamen was sick with yellow fever, who died a few days after his admission into the marine hospital; the remaining crew, about twenty-two in number, were healthy, and continued so until eight days after, when a passenger sickened with the same disease. The ship was detained eighteen days at quarantine, from the time that the last sick man was removed to the hospital; all the crew continuing healthy, she was permitted to proceed to the city (no stores being built at Staten-Island at that time to receive the cargoes of infected vessels, no part of the General Wayne's was removed while she remained at quarantine) where, in a few days after she came to a wharf, and when they began to unload, several inhabitants in the neighbourhood sickened and died of yellow fever." p. 28, 29.

"15th Q. What was Dr. Ledyard's opinion of the origin of yellow fever, that it was imported from the West-Indies, or generated at home?"



"*A.* Dr. Ledyard believed in the exclusive importation of the yellow fever, and his reasons for it were, that during his residence in this city, before and after the American revolution, when it was in a very filthy condition, he never saw the disease; and while practising on Long-Island, he frequently had patients with malignant and infectious fevers arising from animal and vegetable putrefaction, but never attended with such symptoms as occur in yellow fever; which disease he attended on Long-Island, in 1798, brought from this city." p. 30, 31.

The eighth paper is from Dr. D. Hosack, and furnishes, among others, the following facts :

"Dr. Ledyard, when he first entered upon the duties of the health-office, as he himself informed me, went to Staten Island with the belief that the yellow fever was not an imported disease, but generated at home. A few weeks before his death he informed me that he had been compelled to change his belief, and that all his observations at the health-office satisfied him that the yellow fever was exclusively derived from the West-Indies. That he had seen the bilious remittent from our southern states, and the ship fever in the crowded ships from Ireland, but that he had never seen the black vomit and the orange-coloured skin attending either the fever of the Irish vessels, or the bilious remittent from Georgia or the Carolinas. The records of the New York hospital will also testify, if necessary, that in no one instance where the ship fever of the Irish vessels proved fatal, it was terminated either by the yellow skin or black vomit. Three or four years since many of the sick were conveyed to our City Hospital, and were attended by Dr. Hamersly and myself; and, generally where they proved fatal, it was not in less than from fifteen to twenty-five days: not so certainly with yellow fever." p. 32, 33.

The ninth article is from Dr. Thomas Parke, one of the physicians of the Pennsylvania hospital, and relates to the mode adopted by the managers of that institution, during the prevalence of the fever in Philadelphia in 1798. A statement of facts tending to prove the contagious nature of the yellow fever at Germantown in the year 1798, from the pen of Dr. Wistar, the present pro-

fessor of anatomy in the university of Pennsylvania, constitutes the tenth article, and is peculiarly interesting, inasmuch as it gives the most satisfactory proof of the contagious nature of the yellow fever. We are under the necessity, however, of referring the reader to the volume itself, as our limits will not permit us to give the particulars of the many cases which Dr. Wistar has detailed. The article next in order is a letter from Dr. George Bensall, of Germantown, addressed to the author of the preceding paper, and is directly in proof of the facts and opinions advanced by Dr. Wistar. The twelfth and thirteenth articles consist of two letters from Dr. Charles Meredith, of the Philadelphia dispensary, and the fourteenth from Dr. John Wilson; these three articles are also in proof of the contagious nature of the yellow fever. A short notice of the origin of the fever which prevailed in New-Haven in 1794, from Dr. Elias Munson, and a still farther account of its progress, together with an extract of a letter from Dr. Munson, sen. next follow. The greater part of these papers have already been extensively circulated, and contain undeniable evidence of the exclusive importation of the yellow fever into that city. We are next presented with an able refutation, by Dr. Munson, sen. of Mr. Noah Webster's account of the introduction of the disease into New-Haven. Next follows a letter from Dr. James Stratton to Dr. Griffitts, giving an account of the introduction of this disorder into New-Jersey from Pennsylvania. The eighteenth paper is addressed to Dr. D. Hosack, by the learned Dr. John Stewart, of Grenada, and contains, besides many other valuable facts, an account of the first appearance of the yellow fever into Grenada, by the ship Hankey, in 1793. We shall not, at present, make any quotation from it, but

probably at some future day offer it entire, with the method of treatment Dr. Stewart pursued, which portion of the letter has not yet been made public. We shall only remark, that Dr. S. believes the disease to have originated from contagion imported in the ship Hankey, an opinion maintained with great ability by the celebrated Chisholm, in his "*Essay on the Malignant Pestilential Fever*," and still further supported in his late letter to Dr. Haygarth, which has already been noticed at some length.\* Here we cannot avoid expressing our surprise, that the editors of the Medical Repository, after making the yellow fever the principal subject of their work for years, have studiously omitted to take the least notice of this valuable and highly interesting letter; a mode of procedure which we can hardly reconcile with that strict impartiality and love for truth which those gentlemen have never been backward in professing. The concluding article is from the pen of Dr. Wm. Currie, and gives a clear detail of the origin and progress of the yellow fever of Philadelphia in 1805.

We have bestowed a more than ordinary share of attention on the work before us, both on account of the highly respectable and unanswerable testimony by which the "Facts and Observations" are supported, and because we consider the subject to which they relate as one of primary importance to our country, and deeply interesting to every member of the community.

\* See the Register for July, p. 68-87.



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ART. III. *An Inaugural Dissertation on the Medical Virtues of the WHITE OXIDE OF BISMUTH, with some preliminary Observations on the Chemical Properties of that Metal.* By SAMUEL W. MOORE, A. B. New-York. T. & J. Swords. 8vo. 1810. pp. 39.

The object of Dr. Moore, in the present dissertation, is to make known the medical virtues of the white oxide of bismuth, and to recommend its use in gastrodynia, pyrosis, cardialgia, and other affections of the stomach connected with dyspepsia. For this purpose he has given a short account of the recent introduction of this medicine into practice, followed by an abstract of cases in which it has been successfully employed by several eminent practitioners in Europe in the diseases just mentioned, with a relation of several cases in which he himself had an opportunity of witnessing its effects.

It is well known that Dr. Odier of Geneva first introduced this medicine into practice in the year 1786. In 1800, Dr. Marcet, of London, published an account of its successful employment in affections of the stomach. Dr. Bardsley, of the Manchester infirmary, induced by the representations of its efficacy, published by Dr. Marcet, made trial of the same remedy in similar affections; and in 1807 gave to the public, in his Medical Reports, a detail of several cases in which he had prescribed it. The result of his experience was in confirmation of what had before been made known by doctors Odier and Marcet. In addition to this evidence, in support of the medical properties of the white oxide of bismuth, we are in-

formed by Dr. Moore, that it has been employed with great advantage in a number of cases of debility and spasmodic affection of the stomach by doctors Post, Osborn, and Stringham, of this city.

We insert the third case related by Dr. Moore, and shall only remark, that upon the whole we consider the evidence of the medical virtues of this new remedy to be such as to entitle it to the particular notice of physicians in the treatment of dyspepsia and other affections of the stomach in which Dr. Moore has recommended its use.

*New-York, Sept. 24, 1810.*

"Case 3d. Mr. B. the subject of the following case, has been for three or four years dyspeptic; during which time he has almost continually suffered from cardialgia and pyrosis, and very frequently severe colic pains. The fluid which he threw up from his stomach was, at times, he said, so extremely acid, that it felt as if it were cutting his throat while passing through it. He has been long in the habit of using alkaline solutions, absorbents, &c. but without effect.

"Mr. B. has, at my request, very obligingly drawn up a statement of his own case, the substance of which I shall give nearly in his own words.

"I have been for several years troubled with acidity on my stomach, a watery fluid running from my mouth, and an unpleasant sensation, or dull pain at my breast, frequent colic pains; sometimes a cough, which was always accompanied by an unpleasant taste: a great heaviness and inclination to sleep, with an aversion to motion. My appetite has always been good, and sometimes, indeed, voracious; but even at those times my stomach would be often disgusted by the first mouthful of food I swallowed. When the heaviness came over me, I felt a sensible diminution of my strength and spirits. I have taken soda, magnesia, chalk, and rhubarb, but have found no relief from them. On the 16th of September I called on Dr. Moore, and obtain-

ed from him a few powders, of which I have taken three a-day, and have not for the last five days felt any symptoms of the complaint.

*September 24, 1810."*

Mr. B. took fourteen doses of those powders, containing altogether, one drachm and ten grains of the oxide. He assures me that he has never felt better than he does at present, and says, that if the powders produce a permanent cure, it will be one of the most happy events of his life.

Sept. 29th. I saw our patient this day, when he informed me of his having continued thus far perfectly free from all indisposition.



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## DOMESTIC INTELLIGENCE.

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### *On Canal Navigation.*

WHOEVER takes the trouble of turning to the first number of this volume, page 110, the second number, page 145, and the third number, pages 376 and 384, will discover that we have been solicitous to prevail upon our fellow citizens to attend to the subject of canal navigation. We attempted to show, in No. 2, page 145, by a moderate calculation, the immense advantage our citizens would obtain by transporting their produce in canals instead of using wagons as they do at present. Those papers were written before the ground, from lake Erie to Seneca lake, had been surveyed, and before the commissioners had drawn up their report on the subject. They were written by a correspondent, who had been a careful observer of the means by which cities had acquired splendour, and nations had become affluent and prosperous. By the following report of the commissioners, the reader will discover that the measures we recommended for promoting the wealth and dignity of the state, are nearly the same that the commissioners, after mature deliberation, have submitted to public consideration.

### REPORT.

*The Commissioners appointed by joint resolutions of the honourable the Senate and Assembly of the state of New-York, of the 13th and 15th March, 1810, to explore the route of an inland navigation from Hudson's river to lake Ontario and lake Erie, beg leave to Report,*

THAT they have examined the country as critically as time and circumstances would permit, and caused surveys to be made for their better information.

They beg leave to observe, on the present navigation of the Mohawk river, Wood creek, Oneida lake, and the Oswego river, which extend from Schenectady to lake Ontario, (saving only a portage at the falls within twelve miles of Oswego) that experience has long since exploded in Europe the idea of using the beds of rivers for internal navigation, where canals are practicable. The reasoning on that subject applies with greater force in America. For in the navigation of rivers, reliance must be had principally on the labour of men; whereas, along canals, the force employed is generally that of horses. But the labour of men is dearer, and the subsistence of horses cheaper in America than in Europe. Experience, moreover has, in this country, declared against following the course of rivers more decidedly than in the old world; for there, notwithstanding the excellence of the highways, transportation is performed (between Rouen and Paris, for instance) in boats drawn up the river: but along the Mohawk, though the road from Schenectady to Utica is far from being good, it is frequently preferred to the river.

By the aid of canals, a good navigation (for boats) can unquestionably be made from Schenectady to the falls in the Oswego river, twelve miles south of lake Ontario. From Schenectady to the Hudson, and from the falls just mentioned to lake Ontario, a boat navigation is also practicable; but whether it be advisable, may deserve consideration.

A preliminary point to decide, is, whether by this route, vessels can be taken across, of size and form, to navigate with advantage, lake Ontario and Hudson's river; such, for instance, as sloops and schooners of fifty or sixty tons.

The commissioners believe this to be impracticable, for want of water at the summit level. Whether a sufficient supply even for boats can be obtained in a dry season, should the whole trade of the great lakes be turned that way, is a matter worthy of consideration.

Admitting, however, that the boat navigation were completed to the falls, in Oswego river, and a sufficient supply of water secured, it remains to inquire whether it would be prudent to expend what may be needful on the navigation between those falls and the lake.

It will be seen by the report of the surveyor hereunto annexed, that in this distance there is a descent of little less than one hundred feet, and that the circumstances are peculiarly unfavourable; so much so, that an intelligent practical man, (Mr. Weston) formerly pronounced it impossible. That word, however, when used on occasions of this sort, must be understood as standing in relation to the means which can prudently be applied to the end.

In examining the amount of expenditure which prudence may justify, it is to be noted, that if the same boat which arrives at the upper end of the Falls, could, after reaching Oswego, proceed on her voyage, it might be worth while to calculate whether the saving of time and expense in lading and unlading, would bear any rational proportion to the cost of completing that navigation; but that is not the case, and therefore it would be more advisable, if the communication be deemed of sufficient importance, to construct a railway.

This, according to the estimate of an intelligent and experienced man, (Mr. Latrobe) annexed to Mr. Secretary Gallatin's report on canals and roads, would cost about 10,000 dollars per mile; and by the aid of it, one horse could transport eight tons, supposing the angle of ascent not to exceed one degree.

But an angle of one degree will ascend in a mile upwards of ninety-two feet, or nearly as much as the difference of level in the whole twelve miles. If, then, two dollars be allowed for a horse, waggon, and driver's wages, (with such return load as he can procure for his profit) and ten cents be allowed for the use of the railway, and if it be supposed that only five tons be taken instead of eight, the cost will be for each ton, the twelve miles, forty-two cents, or three and a half cents per mile: at which rate, one hundred and forty miles, (a greater distance than between Oswego and Lewiston, along lake Ontario) would come to four dollars ninety cents, being thirty-five cents less than the freight now paid.

A question, however, of more importance, presents itself. Admitting that it were easy to complete a boat navigation from Rome to lake Ontario, and more difficult and expensive (in comparison) to effect a canal navigation to lake Erie, would it not be advisable to descend into lake Ontario, rather than encounter the difficulty and expense of the other course?

The commissioners believe it would not; and without relying, as they might, for support of their opinion, on the comparative expense of transportation, (a topic which will find a better place elsewhere) it is sufficient to say, here, that articles for exportation, when once afloat on lake Ontario, will, generally speaking, go to Montreal, unless our British neighbours are blind to their own interest; a charge which ought not lightly to be made against a commercial nation.

Freight from Niagara to Oswego will, from the difficult and dangerous access to that harbour, be as high as to the head of the rapids



in the river St. Lawrence. The descent from thence to Montreal is less than the ascent from Oswego to Rome. It is true that the lake Ontario is estimated at one hundred and ninety-six feet above tide water, and the Rome level, only one hundred and eighty-four feet above the lake : but there is a considerable descent in the river St. Lawrence, in a distance of about seventy miles, to the lower end of the present sloop navigation, through which the current is sometimes strong. There is also a considerable descent from Montreal, in a distance of about thirty miles to tide water in the lake St. Peters. Perhaps it will be found that an average allowance of three inches per mile, (in the whole, upwards of twenty feet) is not too much, and that the river at Montreal is not one hundred and seventy feet below the upper surface of the gallot's rapids. In the distance of one hundred miles between these places, there are forty of still water, viz. about thirty in lake St. Francis, between the foot of Long Saut and the head of the Coteau du Lac rapid, and upwards of ten in the lake of the Two Mountains, between the foot of the cascade at the cedars, and the La Chine rapid.

Thus there will remain but sixty miles of canal, with an average fall of thirty-four inches per mile. The land descends proportionately to the water, so that there can be but little deep cutting ; the soil is easy to dig ; there are no streams or ravines of any consequence to cross ; and there is an inexhaustible supply of pure water, which never varies much in its height, for any canal whatever.

Under circumstances so propitious, it is probable that a good sloop navigation from above the gallots, to Montreal, would cost less than a good boat navigation from Oswego to Rome. The extent of this last, deducting the Oneida lake, is fifty-six miles the fall is on an average near forty inches per mile ; the supply of water is doubtful, and in twelve miles of the distance, obstacles almost insurmountable present themselves.

These are facts, to which it would be in vain for the citizens of the United States to shut their eyes. The eyes of a rich, enterprising commercial rival are open ; and when it is considered that (if the means of easy export be supplied to the inhabitants who may settle near the great lakes) that country will, in no distant period, furnish a more abundant stock of commodities for foreign trade, than is now sent from all the Atlantic ports of the union—it would be absurd to doubt, whether, in the competition for that commerce, our neighbours will employ the means in their power. Nor must it be for

gotten, that the revenue which under present circumstances is raised from commerce, and which no probable change will reduce below an ad valorem duty of ten per cent. cannot but operate in favour of our rivals. True it is, that as far as regards the pecuniary benefit of those who may settle along the lakes, the route by which their products are sent abroad, and their supplies of foreign articles introduced, must be to them a matter of little consequence. But the political connexion which would probably result from a commercial connection, certainly deserve the consideration of intelligent men.

The commissioners have no doubt, that obstructions at the mouth of Oneida lake may be removed, so as to lower the surface of that lake from eighteen inches to two feet, at no great expense, and with little, if any injury to the navigation. But they have not been able to satisfy themselves that the lands contemplated in the petitions which the joint resolutions refer to, would be in any wise affected by operations at the mouth of Oneida lake. According to the information they have obtained, these lands are inundated by the waters of Butternut, Limestone, Chitenengo and Canaserago creeks, obstructed before their entrance into the lake.

In respect to an inland navigation direct from lake Erie to Hudson's river, the commissioners beg leave to refer for information to the annexed reports and maps of Mr. James Geddes, employed at their request by the surveyor-general. From these it is evident that such navigation is practicable. Whether the route he sketched out will hereafter be pursued; whether a better may not be found, and other questions subordinate to these, can only be resolved at a future time, when an intelligent man, regularly bred to this business, shall, under the direction of those on whom the public may think proper to devolve the superintendence, have made a more extensive and careful scrutiny than the time and means of the commissioners would permit. They conceive, however, that it may not be improper to say a few words on the topography of the country, which may be divided into three parts, nearly equal.

The Mohawk river, as is well known, runs in a deep ravine, and there is, generally speaking, along its banks, a vale of rich soil. In different places, however, spurs from the neighbouring hills project themselves to the edge of the river. On the north side fall in sundry small streams, and two (the east and west Canada creeks) which are large and copious, especially the latter. They are both rapid, and run in deep ravines. On the right side, also, there are several tribu-

tary streams. The most considerable of these is the Schoharie, which, rising among the Catskill mountains, has scooped out, with its impetuous waters, a wide and deep ravine.

The stream next in importance, coming in from the south, is the Oriskany, which is especially valuable, because it enters the river not far from the summit level at Rome, and may, perhaps, become useful as a feeder. This forms the first, eastern, or river division, in which navigation, though defective, already exists. In this division, with proper management, there will be no defect of water for a boat canal, unless, perhaps, in very dry seasons, at the summit level.

The second, middle, or lake division, extends from the summit level westward to the outlet of the Canandarque lake. In it, lie four lakes, the Otisco, Skeneateles, Owasco and Canandarque, higher than any canal which may be extended from lake Erie to the Hudson, and furnishing a copious supply of water. Of the two largest lakes, the Seneca, encreased by a stream from Crooked lake, lies nearly on the same level with Rome, but the Cayuga much lower.

In this division, the turnpike road crosses high hills, but they all terminate not far north of it, leaving a large deep valley, upwards of eighty miles long, from east to west, and about twenty wide from north west to south east. If, indeed, the Cayuga lake, embosomed in a ravine which opens to the north on the valley, be considered as part of it, the breadth will be fifty miles. In this valley lie the Onondaga, Cross, and Oneida lakes. It is bounded on the north, by a dividing ridge of land, which stretches from near the Gerundegat bay, eastwardly, to the neighbourhood of Rome, where it joins the dividing ridge north of the Mohawk, between the waters of the St. Lawrence and those of the Hudson.

The third, western, or dry division, extends from the western boundary of the lake division to lake Erie. In this, although the Genesee river runs through it, a want of water is already felt, and will daily become more sensible, as the country is cleared. The Genesee river itself, is a torrent, which, however copious, or even superabundant it may be in the spring, is in the autumn almost dry. This tract of country, especially after passing the Flats of the Genesee, may, with little violence to the propriety of language, be called a plain : and here it may be proper to notice a peculiarity in the shape of the northern, and much of the western part of the state, which distinguishes it widely from the country lying south east of the mountains.



The descent from the dividing ridge, northward, is generally by a gradation of plains,\* nearly horizontal. These, and the streams by which they are watered, have a similar, and, as it were, a simultaneous descent. Thus the rivers are but a kind of lakes, lying in plains, and communicating by falls and rapids with each other. These gradations have sometimes a small rise, immediately before descent; at other times, in ascending from one, we come immediately to the other. In no case is the peculiarity of shape more worthy of remark, than at the cataract of Niagara. In coming from lake Erie, where the sight cannot reach over the expanded surface, proceeding along the level bank of the Niagara river, to the head of the rapids immediately above the falls, and thence pursuing a northern course, the traveller ascends but thirty-eight feet before he descends three hundred and forty-five to the plain in which lake Ontario is stretched out from east to west upward of one hundred and sixty miles. The surface of lake Erie is three hundred and twenty-nine feet above that of lake Ontario, which being taken from the whole descent just mentioned, leaves for the rise of land between those two great reservoirs, but sixteen feet.

This rise, and others similar to it, are called by the inhabitants, the ridge, the ledge, the slope, and the hill. A more proper general appellation, perhaps, is, the steep, though occasionally by the elevation each way, it becomes truly a ridge, or from the horizontal strata of stone as truly a ledge. In some places the descent is by a gentle slope, in others, more precipitous, and in some, almost perpendicular. Two of these extend eastward from the shore of Niagara river nearly parallel to, and distant from each other about fourteen miles. The higher, or southern steep, commences at Black Rock, where the river issues from lake Erie. The northern commences at the falls, and after an eastern course of fifty or sixty miles, bends towards, and approaches the southern, after which they both take a southern direction for thirty miles, but return again on the east side of the Genesee: or to speak more correctly, that river, after breaking through them by successive falls of sixty and ninety feet, thirty miles south of the high road, in the township of Leicester, runs in a ravine to the northern part of that township; when the steeps again diverge, the southern stretching eastwardly to the west side of Seneca lake, and then south-

\* The word *plains* might lead into error. It is therefore proper to state that hills are scattered about, which vary the surface to the eye. But on examination it will be found that, generally speaking, their bases are all on the same extended plain.

erly to the high grounds from whence flow the waters of the Tioga ; while the other keeps an eastern direction to the hills from whose southern declivities flow the Chenango and Unadilla. There is another steep still more north, which branches out from that last mentioned, near the eighteen miles run, (a stream whose mouth is at that distance from that of the Niagara river) and diverging northward is for some distance in its eastern progress indistinct. It extends, however to the lower falls of the Genesee, and is there crossed by that river, as also beyond it by streams, which fall into the Gerundegut bay ; after which it becomes properly a ridge, and extends beyond the falls of Oswego river, as has been already mentioned. Of these three steeps, ledges, or ridges, the most southern is distinguished by limestone mixed with flint. The middle, by the same stone mixed with shells, and the most northern, by freestone and slate. Over the southern steep, west of the Genesee, fall Ellicot's brook and the Tanewanta, (which enter Niagara river by the same mouth opposite to Grand Island) also, Allen's brook, which makes at its passage the Buttermilk falls, and runs to the Genesee. Over the middle steep, in the same division, falls the Oak-orchard brook, which enters lake Ontario, about thirty miles east of Niagara river. The lower falls of this brook, as well as those of the Genesee, are over the northern steep.

The Canesus, the Hemlock, the Honeyoyo, the Canandarque and the Crooked lakes, lie south of the southern steep. The Seneca, the Owasco, the Skeneateles and Otisco lakes, lie south of the middle steep ; north of which lie the Cayuga, Onondaga, Oneida and Cross lakes.

The Tanewanta falls over the southern steep twenty-five feet, and passing the village of the same name, runs in a level valley of brown clay upwards of twenty miles to its mouth in Niagara river.

From the Tanawanta village, north eastward, in less than five miles, (chiefly through a swamp) the Oak-orchard brook receives the waters of the swamp, and falls, as has been already mentioned, into lake Ontario. The Tanewanta brook, three feet higher than the swamp, is separated from it by ground, whose elevation is not more than five feet, the distance is short of a mile, and the soil being clay, it will be easy (by turning its waters into Oak-orchard brook) to convert the Tanewanta from its mouth, upwards, into a canal. It has above eleven miles from its mouth, a depth of twelve feet, interrupted, nevertheless, by five bars, or shallows, composed of round stones, buried in clay. During this space, the breadth is in general forty yards, though in the narrowest part not more than thirty. The first shallow, about three miles from the mouth, is called Miller's Ford, and is not above



twelve yards wide; the next, about a mile beyond it, called Houses Shallow, extends east and west nearly one hundred and twenty yards, the depth of water from two and a half to three feet. Two miles further up is Christman's Rapid. This extends from east to west near two hundred and fifty yards, with a depth of from fifteen to eighteen inches; at this rapid, the fall is three inches, except when a westerly wind brings up the water of lake Erie. The breadth of the Tanewanta is here forty-eight yards, and no where below it less than forty.

The next bar, about a mile from the last, is called Van Slyke's Shallow; it extends forty-two yards, the depth in the shortest place twenty-inches, but in general from two to three feet. The fifth and last bar, at eleven miles from the mouth of the creek, extends near one hundred and eighty yards, and has from one to two and a half feet of water.

To convert this water course into a canal twelve feet deep, during the whole distance of eleven miles, will require, at most, an excavation of eighty thousand cubic yards. The surface here is four inches higher than at the mouth, which is five feet lower than the surface of lake Erie. At about five miles and a quarter north from this place, in the middle steep, is the source of one branch of the eighteen mile brook, at a distance of about ten miles from lake Ontario, and about three hundred feet above its surface; consequently, near thirty feet below the surface of lake Erie. The greatest elevation of ground between them is twenty-one feet above that surface; it is, however, on an average, for the space of three miles, twenty feet, and the remaining two miles and a quarter, about seven feet.

For a more particular knowledge of the ground, reference must be had to the profile made by Mr. Geddes, and which is hereunto annexed. It is self-evident, that the cost of excavation per cubic yard, must depend on the substance in which the excavation is made; it must depend, also, on some other circumstances. In deep cutting, for instance, not only must there be wide cutting to prevent the earth from falling in, but there will be, generally speaking, more labour, and consequently more expense in moving the earth after it is dug. It may become, therefore, in many cases, more advisable to pierce the earth by a tunnel, than to take down the top of a hill.

In the present instance, by means of wooden railways, which may be constructed from the surrounding forests for temporary purposes at a trifling expense, the materials may, when dug, be made, as it were, to transport themselves along by gentle declivities, to fill that part of the ravine through which the canal is to pass.



In the construction of canals when recourse is had (as must generally be the case) to rivers for a supply of water, it is found necessary to guard with scrupulous care, and, not unfrequently, at enormous expense, against those floods which, pouring a torrent into a canal, and tearing down its banks, might at once destroy the navigation and inundate the country.

Moreover, it is found, that canals depending on rivers, frequently, like the rivers themselves, want water in the season when it is most necessary. Indeed, to suppose the quantity of water in a river, when turned into a canal, will remain the same, would lead to serious disappointment. Much must be allowed for evaporation, and, notwithstanding the utmost care, more will filter through the sides and bottom of a canal, than those of a river, which are generally saturated.

Thus, then, two prominent evils present themselves in feeding from rivers, viz. In spring they pour in too much water, and can afford none in autumn, when it is most wanted. There is still another evil, which, though not so eminent, becomes eventually of serious moment. When the country shall be cultivated, streams swollen by showers will bring down, mixed with the waters, a proportion of mud, and that, in the stillness of a level canal, will subside, and choke it up. It is also to be noted, by those who shall construct canals in this country, that the true character of a river cannot now be known. Large tracts, (for instance west of the Genesee) which appear as swamps, and through which causeways of logs are laid for roads, will become dry fields, when no longer shaded (as at present) by forests impervious to the sun.

In the progress of industry, swamps (the present reservoirs of permanent springs that burst out on a lower surface) will be drained, whereby many of those springs will be dried. Of such as remain, a part will be used to irrigate inclined plains.

Moreover, in every place tolerably convenient ponds will be collected for mills and other machinery, from whose surface, as well as from that of the soil, the sun will exhale an ample tribute of vapor.

Thus the summer supply of rivers will be in part destroyed, and in part consumed, whereby their present autumnal penury must be still farther enhanced. But in the spring, the careful husbandman and miller will open every ditch and sluice to get rid of that water, which, though at other times a kind friend and faithful servant, is then a dangerous enemy and imperious master. Of course, much of what

is now withheld for many days, will then be suddenly poured out. The torrents must, therefore, rage with greater fury hereafter than they do in the present day.

Considerations like these, while they cast a shade over many contemplated enterprises, give, by contrast, a glowing hue to that which we have now to consider. The canal from lake Erie to the Hudson may be fed by pure water from lakes, provided mounds and aqueducts be made over intervening vallies, or the canal be carried round them. In every case the attending circumstances must decide.

In general, also, it is only after a more accurate examination of the ground by a skilful engineer, well practised in such business, that the best mode can be adopted for the species of navigation which may be ultimately determined on, viz. whether for vessels which navigate Hudson's river and lake Erie, or for barges of from twenty to sixty tons.

If the passage were only of a few miles, the propriety of bringing vessels of eight feet draught of water across (if practicable) would be readily admitted. But it may well be questioned, whether, to save the expense of lading and unlading at each end of a canal three hundred miles long, the expense of cutting two yards deeper than would otherwise be necessary, ought to be encountered.

It has generally been assumed, and perhaps too lightly admitted, that canals should be made on a perfect level. This axiom would not be questioned, if the transportation each way, were of equal burden, if the distance or the frequency of good feeding streams were such as easily and constantly to supply, without danger of excess, the incessant waste of water by absorption, leakage and evaporation, and if the waters to be connected, were on the same level. But in a case like the present, rational doubts may be entertained. The difference of level being upwards of five hundred feet, all the descent which can prudently be obtained by an inclined plain, is so much saved in the expense of lockage; and in all human probability, the transportation, for centuries to come, will be of so much greater burden from the interior country, than back from the sea, that a current from the lake is more to be desired than avoided, more especially as it will in some degree counteract the effect of frost. That inexhaustible stream of limpid water which flows out of lake Erie, with little variation of height to endanger the canal, is a strong temptation to use it exclusively, until auxiliary supplies can be drawn from other reservoirs equally pure. Nor is it improper in this case to

remark, that it is impossible there should ever be a considerable variation in the surface of Niagara river, at the mouth of the Tanawanta. No supposable fall of rain or melting of snow, even if both were to take place at the same time, in the country which surrounds the great lakes, could raise in any considerable degree their extended surface. Indeed, we know from experience, that a greater difference of elevation at the mouth of lake Erie is occasioned by a change of wind than by any variation of the seasons. Admitting, however, a considerable rise of water, no matter from what cause, at the source of Niagara river, it cannot suddenly, from the narrowness and shoalness of the channel, produce a correspondent rise at the foot of the Black Rock rapid; and the elevation there must, in the nature of things, exceed that which is occasioned by it fifteen miles lower down; more especially as the river, including the two channels round Grand Island, has for the greater part of the way nearly three times the breadth which it has above. If, however, it were only a deep bay, the water pressed forward by the wind, would be piled up to a considerable height, but instead of that, the river here, with a breadth fully double to what it has at Black-Rock, precipitates itself over the first ledge in its headlong course to the cataract: so that an increase of height is instantly counteracted by the increased rapidity with which it rolls over the Rock.

In all events, it would be advisable to use this water exclusively for a great part of the way, even if the country afforded other resources; and to this effect, there must be some descent in the canal. What the precise amount of that should be, in every mile, the commissioners presume not to say. They do not pretend to sufficient knowledge on the subject, and with all proper deference, refer it to a practical engineer.

Nevertheless, like other men possessed of common discernment, they perceive not only that the quantity of water which runs in a given time, must be proportionate to the rapidity with which, and the aperture through which it passes; but also that the rapidity itself will depend not merely on the declivity, but also on the mass; because, in a deep and wide channel, the friction must be less than in one that is narrow and shoal. It will depend also on another circumstance, whose effect (that single cause remaining the same) will vary, according to such of the preceding circumstances as may be connected with it. Admitting, for instance, a stream to be deep and wide in descending an inclined plain its velocity will be accelerated. But if



the inclination be not great, and the channel, shoal and narrow, the friction may so counteract the descent as to retard the velocity.

From these considerations it is evident that the sum of descent must depend primarily on the quantity of water required. This, in navigation ascending and descending by locks, must be greater than when carried along a plain. It must also be greater in a loose, than in a stiff soil. Moreover, the quantum of descent required must, after the needful supply of water is ascertained, depend on the length, the width, the depth, and finally on the course of the canal, whether direct or serpentine. And here the same common sense presents another important consideration. The amount of rapidity which may with safety be hazarded will depend on the texture of the substance through which the current passes. No navigable velocity can injure a rock of granite; but a gentle current will sweep off the substance of bog meadow. In like manner, banks which resist when the course is direct, may be eaten away, and the current itself be retarded, if propelled along a tortuous course.

The commissioners cannot, therefore, too often repeat that their report must be accepted as suggestions proceeding from a superficial view, and not as conclusions founded on sufficient and scientific investigation.

After this preliminary caution, they assume hypothetically that a canal were run in such manner, as that the average descent were six inches in every mile. Whence, taking the surface of lake Erie as the standard level, they have in gross the following results :

From lake Erie to	Miles.	Descent.	Total descent.	Actual descent.
The mouth of Tanewanta,	10	5 feet	5 feet	5 feet
Genesee river, about	68	34	39	65
Seneca lake,	46	23	62	145
Cayuga lake,	6	3	65	195
Rome summit,	66	33	98	145
Little Falls of Mohawk,	38	19	117	{ 203 1-2 245 1-2
Schoharie,	38	19	136	293 1-2
Height of land between Schenectady and Albany, }	24	12	148	220
Hudson's river,	14	7	155	525
	<hr/> 310			

Casting an eye on the map, it will be seen, that the first difficulty in the above course will be, to cross the Genesee at an elevation of twenty-six feet above its surface. But unless the canal be lowered down to that river, the expense of an aqueduct cannot be avoided; because from the upper falls, which are too high, there is little descent to the lower falls; and if, from any cause, it be advisable to cross it by an aqueduct, the addition of a foot in the height will not much increase the expense; indeed, considering the swell of the river in freshes, an elevation short of twenty feet would scarcely leave sufficient space under the arch.

The next difficulty will be in crossing the mouth of Seneca lake by an aqueduct eighty-three feet high. But this also, if a convenient place can be found, will not be important, because a moderate aperture will suffice to void the equable stream from that lake.

The third difficulty is at the mouth of Cayuga, where the elevation is one hundred and thirty feet. Even this might be encountered without any unusual hardihood, if the hills approached each other. But the valley to be crossed is not much, if any thing, short of a mile; and to erect a mound of that length, and of the sufficient height and breadth, is an herculean labour. Whether it will be performed, must depend on the arm that undertakes this task, respecting which, a few words may find their proper place hereafter.

Supposing, however, that difficulty to be surmounted, it is believed that none will remain which cannot be, in a considerable degree avoided by bending occasionally to the southward, and returning round the northern points of the hills, till the canal is brought opposite to Rome. Its elevation there above the Mohawk will be forty-seven feet or less, by one foot for every two miles that it may be lengthened. The general face of the country here, leaves no room to doubt, that convenient ground can be discovered south of Rome, at an elevation of forty feet above the Mohawk. How far it may be practicable, between that place and the hills east of the Schoharie, must be decided by actual survey.

The elevation, if not in other respects injurious, will be useful in passes that might, otherwise, necessitate a descent to the Mohawk. Thus, at the Little Falls at that river, the canal, at an elevation of eighty feet above its upper surface, may, it is believed, be brought through or round the hill at no enormous expense. The still greater elevation of one hundred and fifty feet at the Schoharie, will permit of a considerable bend to find some narrow gorge, and finally, an

elevation of seventy feet above the height of ground between Schenectady and Albany, will enable the engineer to choose for the course of his canal and the position of his locks, the most suitable soil and convenient situations. In a word, if, on due examination, any thing of this sort should be found practicable, instead of depriving the country of water, every drop of which is needed by its inhabitants, they will gain a great addition from the canal; and as to the navigation, singly considered, there can be no doubt but it must in that way be superior to a waving course ascending and descending by locks. For, not to mention the expense of constructing and keeping them in repair, the time spent and tolls paid in passing them, must considerably enhance the freight of goods. But if there be no lockage, and the toll be no more than is needful to keep the canal in repair, it will amount to so little as not to merit notice in a calculation of freight. Rejecting it, therefore, and allowing two horses and three men to take a boat of fifty tons burden, twenty miles a day, which is certainly within bounds, and putting the whole expense at five dollars on the lading, downward, (leaving the return load as profit) or which is equivalent, reducing the distance one half, we have fifty tons transported ten miles for five dollars, being one cent per ton per mile. To speak, then, in round numbers, it will cost three dollars to bring a ton from lake Erie to Hudson's river, being little more than one half of what is now paid for freight on lake Ontario, between Oswego and Lewiston. Without entering into calculations (which every person can easily make for himself) to enumerate the bulky articles which will derive value from such facility of transportation, it may be proper in this place to recur again to the commercial competition with our British neighbours.

A tolerably good navigation up and down the St. Lawrence, already exists; but the cheapest rate at which transportation has been performed within the last ten years between Kingston and Montreal, according to the best information the commissioners have been able to obtain, is one dollar per hundred ascending, and half as much descending the river. But admitting the freight could be so reduced as to be on a level with that between Albany and New-York; admitting, also, that the transportation across lake Ontario could be performed as cheaply as through the proposed canal, and even admitting that the risk on that lake, and of course the premium of insurance, were nothing, still it would follow, that transportation from the head of lake Ontario to Montreal, would cost as much as from the mouth of



Tanewanta to New-York, leaving a preference to the latter of the cost and land carriage from Chippeway to Queenstown. Moreover, nature has given (other things being equal) a decided preference to the port of New-York. There are, generally speaking, six weeks of navigation from Albany, in the spring, before vessels can, with safety, leave Montreal to descend the river St. Lawrence, and as many more in the autumn, after the mouth of that river is closed.

The navigation from New-York, is seldom obstructed ; so that produce deposited there, can be sent to market during five months, in which, at Montreal, it lies a dead weight on the hands of the owner. This circumstance is of especial importance in regard to wheat and flour, which can be sent from New-York, so as to be sold in the south of Europe before those articles can be brought from the Baltic, or gathered in the country ; whereas, if shipped from Montreal in the month of May, they cannot reach Spain or Portugal until after supplies are received from Dantzic, and but a short time before the harvest, which is early in July.

Thus, it is evident that the canal will, if properly effected, turn to the United States the commerce of the upper lakes. Moreover, a side cut, of five or six miles, would, by means of locks, connect it with lake Ontario, in the harbour of the Genesee ; and in like manner a connection would be established with the Seneca and Cayuga lakes, from the heads of which, the short portage by good roads to Newtown and Oswego, opens a communication through the Susquehannah to the Chesapeake. Nor is it improbable, that by running up on the west side of the Cayuga, means may be found to establish water communication with the Susquehannah ; from the great bend of which, a good and short road may be made to the Delaware.

Thus a variety of markets may be opened to stimulate and reward the industry of those who are now, or may be hereafter settled along the great lakes, whose shores, exclusive of lake Superior, are upwards of two thousand miles, surrounded at convenient distances by more than fifty millions of acres of land.

To the question what will the proposed canal cost ? it is not possible to answer with any thing like precision. Indeed, preliminary points are to be adjusted ; and of these, the first is, whether it is to be made for sloops or barges. The expense of the former will be, it is believed, at least double that of the latter. Another question, whether it is to be carried along an inclined plane, or by a line ascending and descending, must be decided by a comparison of the expense and

of the utility each way. In general, however, it may be satisfactory to the honourable the senate and assembly, to receive the information which the commissioners feel no hesitation in giving, that, as far as they have been able to extend their enquiry, there is no part of the civilized world, in which an object of such great magnitude can be compassed at so small an expense. Generally speaking, the course is through a tract of country, the excavation whereof will be easy, and there is at certain convenient distances from the spots where it may be wanted, a sufficiency of free stone as well as of lime stone, with a superabundance of fuel. The subsistence of men, also, and of cattle, will be abundant, and cheap. The wages of the former are, as is well known, high; but measures may certainly be devised to obtain the labour for so great a public work more cheaply than is practicable in private operations on a small scale. But the commissioners beg leave to observe, that no supposable expense can bear an undue proportion to the value of the work. Thus, were it (by giving a loose to fancy) extended to fifty millions of dollars, even that enormous sum does not exceed half the value of what, in all human probability and at no distant period will annually be carried along the canal. The more proper question, perhaps, is, in what time can it be effected: for if an annual sum be appropriated, and secured on a solid fund, it will be effected in time, and the greater sum, the shorter will be the period.

The commissioners have no doubt but that good bargains for the public may be made with those through whose land the canal shall pass; and they have great pleasure in stating that generous offers have already been made by many proprietors, the acceptance of which must necessarily be deferred to the moment when the business, assuming a more substantial form, shall be committed to superintendants duly authorised to treat. Enough has been said to shew that no accurate estimate of the expense can as yet be made. To give some general notion, however, it may be assumed that in common cases, labourers ought to dig and remove to a reasonable distance, eight cubic yards per day. The excavation may therefore be set at the eighth of a dollar per cubic yard. An average breadth of fifteen yards, and depth of one yard, which by means of the mound on each side will be sufficient for four and a half to five feet of water, giving for each yard in length fifteen cubic yards, may therefore be taken at two dollars, and the mile at 3520 dollars: but allowing for the obstruction of trees and roots, not less than 4000 dollars. This gives

for 300 miles, one million, two hundred thousand dollars. The excavation needful to bring a column of water fifteen yards wide, and two yards deep, with sufficient descent from the Tanewanta, through the middle steep, will at the same rate cost two hundred and fifty thousand dollars. Thus to speak in round numbers, the canal, alone, might cost a million and a half, drawn through a favourable soil, lying conveniently without the opposition of rocks or other impediments. Many of these, however, must be expected, and will, perhaps double that sum. Another great expense is that of locks and aqueducts. It is said that the former will cost at the rate of one thousand dollars per foot of ascent for a vessel of fifty tons. This is believed to be a low estimate. At any rate, in a canal like the present, there must be a double set; one for the ascending and one for the descending navigation. Even then it is to be feared, that there will be much of embarrassment and delay. Thus the lockage being taken at two thousand dollars per foot, for three hundred and forty feet of descent and ascent, between lake Erie and Rome, will cost six hundred and eighty thousand dollars, should that waving course be deemed advisable. From Rome to Hudson's river, a descent of three hundred and eighty feet, will call for an addition of seven hundred and sixty thousand dollars.

If, then, the locks be put at a million and a half, it is the lowest rate which can prudently be supposed. It would, indeed, be safer to set them at two millions. There will still remain for aqueducts, embankments and mounds, a considerable expenditure, which cannot at present be ascertained. To estimate the expense of aqueducts, it may be advisable to put the cubic yard of masonry at two dollars, and consider the aqueduct as solid mass. It is true, that not more, perhaps than one third of the materials required for a solid mass will be used. But the workmanship on those materials will be much more costly. Many of the stones must be hewn, and many clamped together with iron. Moreover, the expense, when such buildings are raised to a great height, is proportionately greater than when near the earth. An aqueduct over the Genesee may perhaps be one hundred and fifty yards long. But to avoid mistakes it will be more advisable to suppose two hundred. The height above mentioned is twenty-six feet. But as well to obviate mistakes, as for convenience of calculation, it may be taken at ten yards, and in order to preserve the full breadth of the canal, the aqueduct may be considered as twenty yards wide. Thus we have a result of forty thousand cubic yards of mason-



ry, which at two dollars, will require an expenditure of eighty thousand dollars. A remark which will not escape the most cursory observer, is, that a single set of locks to ascend and descend five and twenty feet, will cost fifty thousand dollars, at the lowest estimation; and on the system of level canals, the descent in this case is sixty-five feet. Excepting the Genesee, no considerable aqueduct will be needful; because the streams from the lakes being equable, small arches may be turned over them, and the canal be carried along a mound of earth. The expense of such mound must depend on the convenience of obtaining materials. Where hills of sufficient elevation in the neighbourhood give the advantage of running along wooden rail-ways, or where the transportation may be by boats, along the canal itself, a mound will cost but little compared to that which is raised solely by the labour of men and cattle. All estimates therefore which are not founded on exact local knowledge, must be vague and uncertain. Assuming however as a basis, the price of one dollar for eight cubic yards; to estimate the expense of a mound over the Cayuga lake, one hundred and thirty feet high, and sixty feet wide, on the top, with an inclination of five and forty degrees, in the descent of the side, we have at the base one hundred and ninety feet, giving a mean width of one hundred and twenty five; which, multiplied by the height one hundred and thirty, is sixteen thousand two hundred and fifty feet, or in round numbers, one thousand eight hundred square yards. These, at the eighth of a dollar each cubic yard, will cost for every yard of the mound in length, two hundred and twenty five dollars. Allowing, therefore, two thousand yards instead of a mile, so as to compensate for the expense of an arch two hundred feet long, with a span of fifty feet over the stream, and for other contingencies, the whole cost might be four hundred and fifty thousand dollars, perhaps half a million.

Under the impression resulting from these observation, it is believed that one million of dollars would provide for every thing of this sort, so as to bring the canal to a reservoir near Hndson's river without locks, for four millions of dollars: a descent there, of from three to four hundred feet by locks, would cost, perhaps another million; or if it should be deemed more advisable to transport by rail-ways, the water used for machinery would probably yield a rent sufficient to keep the canal in repair.

But hitherto, this navigation has been contemplated no further than to the mouth of the Tanewanta, in Niagara river. From thence to

lake Erie, is ten miles, and the last mile, at the Black Rock rapid, is said to have, through part of a fall which is, on the whole, four feet, a rapidity of near seven miles an hour; so that vessels descending below it, may wait a whole season for wind sufficiently strong to get up.

This obstacle, though great, does not appear insurmountable. Perhaps two wharves, similar to those which surround our cities, made impervious to the water, and sunk parallel to each other during the distance of one mile, with two pair of gates similar to those of dry docks, placed so as that the upper one being shut, there shall be still water from below; and that the lower one shut, will make still water above, may fully answer the end. The cost, where wood and stone are so abundant, cannot be great; and as wood is not liable to rot under water, nor exposed in fresh water to the ravages of worms, the work may be sufficiently durable. On the whole, it is conceived that the expense of this national work may be five millions of dollars; a sum which does not, it is presumed, exceed five per cent of the value of the commodities, which, in less than a century, it will annually transport, should it be now commenced, so as duly to encourage population around the upper lakes.

The commissioners hope they shall be excused if, in this place, they advert to a question more important, perhaps, than any other. By whom shall the needful expense be supported?

They take the liberty of entering their feeble protest against a grant to private persons or companies. Too great a national interest is at stake. It must not become the subject of a job, or a fund for speculation. Among many other objections there is one insuperable: that it would defeat the contemplated cheapness of transportation. It should always on occasions of this sort be recollected, that the reasons adduced for grants to individuals in Europe apply inversely here. Few of our fellow citizens have more money than they want, and of the many who want, few find facility in obtaining it. But the public can readily, at a fair interest, command any reasonable sum. Moreover such large expenditures can be more economically made under public authority, than by the care and vigilance of any company.

It remains therefore to determine whether this canal should be at the cost of this state or of the Union. If the state were not bound by the federal band with her sister states, she might fairly ask compensation from those who own the soil along the great lakes for the

permission to cut this canal at their expense ; or her statesmen might deem it still more advisable to make the canal at her own expense, and take for the use of it, a transit duty ; raising or lowering the impost as circumstances might direct for her own advantage. This might be the better course if the state stood alone. But fortunately for the peace and happiness of all, this is not the case ; we are connected by a bond which, if the prayers of good men are favourably heard, will be indissoluble. It becomes proper, therefore, to resort for the solution of the present question, to principles of distributive justice. That which presents itself is the trite adage, that those who participate in the benefit, should contribute to the expense.

The commissioners presume not to go one step farther. The offers of individuals, already alluded to, shew their conviction of that equity by which the state is called on for her share. The wisdom as well as justice of the national legislature, will, no doubt, lead to the exercise on their part of prudent munificence ; but the proportion, the conditions, the compact in short, must be the result of treaty. Whether the honourable the senate and assembly will take steps towards a negotiation, and what these steps may be, it is in their wisdom to determine.

All which is respectfully submitted,

GOUV. MORRIS,  
S. V. RENSSELAER,  
W. NORTH,  
DE WITT CLINTON,  
THOMAS EDDY.  
PETER B. PORTER,  
SIMEON DE WITT.

*February, 1811.*



THE preceding report having been made to the legislature at their last session, the following act was passed, relative to that important object, and the commissicners, named in the same, were appointed, for the consideration of all matters relating to the internal navigation of the state.

*An Act to provide for the improvement of the Internal Navigation  
of the State, passed April 8th, 1811.*

Whereas a communication by means of a canal naavigation, between the great lakes and Hudson's river, will encourage agriculture, promote commerce and manufactures, facilitate a free and general intercourse between the different parts of the United States, tend to the aggrandizement and prosperity of the country, and consolidate and strengthen the union : Therefore,

1. *Be it enacted by the People of the State of New-York, represented in Senate and Assembly,* that Gouverneur Morris, Stephen Van Rensselaer, De Witt Clinton, Simeon De Witt, William North, Thomas Eddy, Peter B. Porter, Robert R. Livingston, and Robert Fulton, shall be, and are hereby appointed commissioners, for the consideration of all matters relating to the said inland navigation, and in case of the resignation or death of any of the said commissioners, the vacancy shall be supplied by the person administering the government of this state.

2. *And be it further enacted,* That the said commissioners, or a majority of them, shall be and are hereby empowered to make application in behalf of this state, to the congress of the United States, or to the legislature of any state or territory, to co-operate and aid in this undertaking, and also to the proprietors of the land through which such navigation may be carried, for cessions or grants to the people of this state, to be received by the said commissioners in their discretion, and also, to ascertain whether loans can be procured on advantageous terms on the credit of this state, for the purpose aforesaid, and the terms on which the Western Inland Lock Navigation Company will surrender their rights and interests to the people of this state.

3. *And be it further enacted,* That the said commissioners shall be and hereby are empowered to employ engineers, surveyors and such other persons as in their opinion may be necessary, in order to enable

them to fulfil the duties imposed on them by this act, and to pay them for their respective services, such sums as may be reasonable.

4. *And be it further enacted*, That the said commissioners shall be and they are hereby required to report to the legislature, at their next session, an account of the whole of their proceedings.

5. *And be it further enacted*, That the treasurer shall pay to the order of a majority of the said commissioners, out of any monies in the treasury not otherwise appropriated, any sum or sums not exceeding fifteen thousand dollars, and for which the said commissioners shall account to the comptroller of this state.

ANTHONY LAMB, Dep. Secretary.

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*Observations on the Quarantine Establishment at New-York, by Joseph Bayley, M. D. Health Officer.*

The following observations, by Doctor Bayley, are here inserted as meriting the serious attention of the American public. And it deserves to be mentioned, as an evidence of the high estimation in which they have been held by our legislature, that a revision of the quarantine laws has taken place at the past session, and most of the amendments proposed in the letter, have been actually adopted, in compliance with the observations and suggestions of the writer.

ED.

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BOARD OF HEALTH.

At a meeting of the Board of Health, on the 20th of December last, the following report was received from Dr. Joseph Bayley, Health Officer.

*To the Honourable the Board of Health.*

New-York, Dec. 20, 1810.

GENTLEMEN,

It has been the practice of my predecessors, to address the board of health, when any facts relative to qua-

quarantine can be offered, whereby that important system can be rendered more efficient in securing the health of the inhabitants, less oppressive to the merchant, and therefore conducive to the general prosperity of the city; the health of which is deservedly an object of the first importance to the citizens—for upon it depends not only their lives, but their business, from which they derive the means of rendering themselves comfortable; consequently this interesting subject is often recurring to them during the pestilential season; and they have generally formed an opinion, that yellow fever is either imported or of domestic origin. Therefore, our quarantine laws have very properly been made to meet public sentiment, as no injury can result from using the requisite means pointed out by the partisans of both opinions, without it should arise from too great a dependance on one set of measures, to the neglect of the other; for both admit that the cause of this disease becoming epidemic, is an impure atmosphere. The importer contends, that this state of air, which produces the usual prevailing fevers of the season, by the introduction of the infection of yellow fever, receives an additional virulence, which causes this dreadful scourge of our sea ports; while the believer in domestic origin, asserts this disease is produced here without the aid of any foreign ferment. It is not my intention to discuss this important subject, but to detail facts, whereby some data will be afforded for the revision of our health laws, which were passed in the year 1799, revised in 1801, and to which supplements were added in 1804, 5, and 6. That they are susceptible of amendment, is admitted by all who have examined them. They have this season been the cause of just complaint from many



merchants, and we have frequently been at a loss to know their true import.

From the reports which have been made to you every week since the first of October, respecting the marine hospital, and vessels liable to the examination of the health officer, a few important facts can be adduced, which will point out some of the advantages, as well as imperfections of the present laws, and shew whence we are to apprehend the danger of importing the yellow fever.

Having been employed in the health department at Staten Island for twelve years, conformable to my observations during that period, I believe that the comparative statement of this year, (for no list has heretofore been made,) is as favourable to the health of the West-Indies, as any of the preceding eleven, and more so than some of them.

To elucidate this subject, I have designated all vessels liable to quarantine from the first of June to the first of October, under four classes.

The first are those from the West-Indies, amounting to one hundred and eighty-nine vessels, navigated by one thousand seven hundred and eighty-three seamen, thirty-five of whom died there, or on their passage thence to this port, most of them after a very few days' illness, and from ports where yellow fever prevailed. On board these vessels were six hundred and twenty-seven passengers, nine of whom died on the passage. All vessels of this class were detained at least four days, for the purpose of

ventilation, and cleansing, and were not permitted to approach the city nearer than three hundred yards until the 1st of October. Fifty-one of the above mentioned vessels coming from sickly ports, or having deaths from malignant fever occurring on board, were, by law, prevented from approaching the city nearer than the quarantine ground.

In the second class are those vessels from the Mediterranean, Asia, Africa, and South America, which are not detained four days at quarantine, but in all other respects under the same restrictions as those from the West-Indies, (except vessels from Canton and Calcutta,) which are permitted to come to the wharves, and are classed with those from Europe. Forty-two vessels from these places, navigated by four hundred and eighty-nine seamen, and having on board forty-six passengers, have arrived, and not one death has occurred on board any of them during the voyage.

The third class contains one hundred and ninety vessels from Europe, navigated by two thousand one hundred and fifty-seven seamen, six of whom died on the voyage, four of them with consumption, one with small pox, and the sixth from personal injury; of this small number, four were from Canton and Calcutta. There were also on board these vessels one thousand three hundred and eleven passengers, seven of whom died, six were children with measles, and one, an adult, with consumption.

The last class are southern coasters, amounting to five hundred and fifty-two, and navigated by two thousand

eight hundred and eighty-five seamen, one of whom died on the passage with fever, several were sick on their arrival with bilious malignant fever, six of whom died at the marine hospital. There were likewise one thousand three hundred and ninety-four passengers on board these vessels, one of whom died with fever. The passages of these vessels are usually performed in so few days, that the seamen frequently do not complain, when coming from a sickly port, before their arrival here. This is a reason why so few deaths happen on board coasting vessels.

Our quarantine laws are very oppressive to the merchants engaged in this trade ; for should a person be sick or die with bilious malignant fever on board a coasting vessel, or should this disease prevail at the place from which she came, the vessel is prohibited coming to the city, even if she has been purified and cleansed, until the 1st of October, although the same disease frequently occurs every season in our city and neighbouring country. *This fever I believe to be essentially different from yellow fever*, a case of which I have never seen from a coasting vessel, without it was prevailing at the port from which she sailed. Further, I have never known a case of yellow fever from Savannah, (Georgia) although many more sick are received into the marine hospital from that place, than from all the other parts of the United States south of Sandy Hook ; and more than twice the number of deaths, as appears from the records of this institution for twelve years, beginning at 1799 and ending 1810. During that period two hundred and fifty-seven patients were admitted into the establishment from Savannah, the most of them with bilious malignant fever. Of these sixty-seven died ; whereas, from all the other



southern ports of the Union, except New-Orleans, only one hundred and sixty-one patients with various complaints were received, twenty-seven of whom died, and eleven of that number with yellow fever.

From the foregoing facts, the following are some of the brief inferences that may be drawn for the improvement of our quarantine laws. First, that the second class of vessels were as healthy this year as those coming from Europe, and, therefore, a discretionary power ought to be given to the board of health to permit them to come to the wharves, when, from the report of the health officer, they are convinced that no danger can arise therefrom. Such as vessels from the south of Europe, within the straits of Gibraltar, with clean bills of health : from Madeira and the Canaries, with wines ; from the Cape de Verd Islands, with salt ; from some parts of South America and India ; for these places are generally healthy, and when they are not, the climate has its full effect upon the crew before their arrival ; so that the evil to be apprehended from these vessels would be immediately observed ; whereas, if the passage could be performed in ten or fifteen days, as frequently takes place with vessels from the West Indies, the danger from them might not appear until some time after their arrival.

Secondly, That there is no risk from vessels coming from Europe, except pestilence prevails at the ports whence they sailed, or they are crowded with passengers, who are liable to ship fever, as happened in the year 1801, when near eight hundred patients, with this disease were sent to the marine hospital, 155 of whom died, and only two persons engaged in the health department escaped the

contagion, although great care was taken to prevent it by ventilation, cleanliness, &c.

Thirdly, *The southern coasters do not bring here yellow fever without it prevails at the port of departure, but intermittent and bilious malignant fever.*

Fourthly, *From West India vessels we are to look for the introduction of yellow fever, and the utmost vigilance is requisite to examine, cleanse and purify them, before they can with safety be permitted to come to the city at the season when pestilence has usually prevailed; but our health laws are more oppressive, as it regards them, than any quarantine system I am acquainted with, inasmuch as they do not admit, that a vessel coming from a sickly port, or having a person who died on board with malignant fever, arriving after the first of June, (although death might have occurred twelve months preceding) can be purified until the first of October; after which, experience has taught us, that no yellow fever has ever commenced its ravages here. Therefore, a vessel may be detained one hundred and twenty days at quarantine, and the last season afforded an instance of one kept there one hundred and fifteen days, which vessel could have been properly cleaned and rendered safe in one quarter of the time. This part of our quarantine system ought to be more discriminating, and not subject a vessel from Turks Island, or any of the neighboring islands, with a cargo of salt only, to the same restrictions which are imposed on vessels coming from those islands where yellow fever frequently prevails.*

Many alterations are also required to make the true

import of the law understood, and to render it more effectual in securing the public health and commercial prosperity of this city ; which can be better pointed out by a revision of those laws, than in this report.

I have the honour to be, gentlemen, your most obedient humble servant,

JOSEPH BAYLEY, *Health Officer.*

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**Extract of a Letter from J. BOSTOCK, M. D. &c. addressed to Doctor DAVID HOSACK, of New-York. Dated Knotshole Bank, near Liverpool, February 4th, 1811.**

“ Two important papers have been read lately before the Liverpool medical society, which are not yet published : one on chorea, by Dr. M'Cartray, who has been uniformly successful in treating this often obstinate disease, by blisters, applied as near as possible to the part affected, or to the part whence the nerves originate. The other paper is by an intelligent member of our society, Mr. Perry, who has removed, in two well marked and acute cases, the tic dolooureux, simply by the affusion of cold water. The attention, not only of the medical, but of the unmedical world has of late been strongly excited by the proposal to cure asthma by smoking stramonium ; the practice has been very extensively tried, and there appears no reason to doubt that it has an effect in relieving the paroxysm ; but it does not seem to diminish their frequency. However, it is no inconsiderable object to procure even temporary ease. Has the hop been tried as a narcotic with you, the extract of rhatany as a tonic, or the oxide of bismuth for pains of the



stomach ? These are articles of the *materia medica* that have been recommended upon very respectable authority. But the most extraordinary novelty in practice is that of copious and repeated bleeding for the cure of diabetes. The practice has been, to a certain extent, confirmed in the Manchester infirmary, under Dr. Bardsley and Dr. Henry. It is now pretty generally admitted, that animal diet will cause the saccharine matter to disappear from the urine, and will diminish its quantity, but that it will not eradicate the disease."

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*The American Philosophical Society of Philadelphia.*

The American Philosophical Society, held at Philadelphia, for promoting useful knowledge, has elected, during the year 1810, the following gentlemen, members of that institution :

DOMESTIC.

GEORGE GIBBS, Esq. Boston.

WILLIAM JOHNSON, Charleston, (S. C.) one of the Judges of the Supreme Court of the United States.

J. H. BRINTON, Philadelphia.

REV. WILLIAM BENTLY, Salem.

JOHN DAVIS, Secretary of the American Academy of Arts and Sciences, Boston.

CHARLES I. WISTAR, Philadelphia.

DAVID HOSACK, M. D. Professor of Botany and *Materia Medica*, Columbia College, New-York.

FOREIGN.

HUMPHREY DAVY, Esq. F. R. S. Secretary of the Royal Institution, &c. &c. London.

JOHN HAIGHTON, M. D. &c. London:

JOHN MASON GOOD, Esq. London:

A. VAUQUELIN, Paris.

*Report of the Physician of the Kine Pock Institution of New-York.*

Since the last communication presented the Board, by the former physician of this department, one hundred and sixty-nine persons have gratuitously received the benefit of vaccination at this institution. Reference to the "Kine Pock Register" will give all the particulars relative to the age of each individual, the place of residence, period of vaccination, and every other circumstance connected with the ultimate result of each case. It may be proper, however, to state, that this disease has, as usual, in no instance proved fatal ; neither has it been accompanied with or succeeded by those eruptive complaints, which popular opinion has connected with, or seems to have considered as necessarily attendant on even the mildest form of this disease. Notwithstanding this favourable result, and the benefits arising from vaccination, it is a matter of regret, that comparatively few (more especially during the last four months) have availed themselves of the opportunities which this institution presents. It is presumed that an equal degree of attention has been bestowed upon this department of the Dispensary as heretofore ; and that public confidence in the benefits of vaccination had not been lessened. It is, therefore, probable that this neglect on the part of parents, especially among the lower class of the community, has chiefly arisen from the almost total disappearance of the small pox ; for with regard to this last disease, it is a subject of great satisfaction to observe, that since the last reports there have occurred but few sporadic cases ; and that it has in only two or three instances proved fatal. But as we have no security against the

reappearance of the small pox in the city, but in vaccination, the subscriber takes the liberty of suggesting to the trustees the propriety of republishing by hand-bills in the out wards of the city, as well as in the public papers, the invitation to the poor to profit by the opportunities they possess of vaccinating their children, as the only preventive against the danger of the small pox. Published by order of the trustees,

GERARDUS A. COOPER.

*New-York Dispensary, Jan. 14, 1810.*

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*Proposed Union of the Medical Schools in New-York.*

The Regents of the University of the state, at their meeting held in Albany on the 1st of April, 1811, having taken into consideration the present state of the medical schools of this city and the unfortunate misunderstandings which have occurred in the college of physicians and surgeons, with the laudable view of uniting the respective talents of the two schools, and thereby to establish on a permanent basis a liberal and well organized medical institution in the city of New-York, have thought it expedient to make certain alterations and amendments in the Charter of the College of Physicians and Surgeons, and to create a new list of officers and professors, by introducing several of the professors of the medical school in Columbia College, as well as other eminent and distinguished individuals whose services were considered important to the success of the new establishment. They have accordingly made the following appointments, which we copy from the official report made by the regents.



**SAMUEL BARD, M. D.** President.

**BENJAMIN DE WITT, M. D.** Vice-President.

**WRIGHT POST and JOHN AUGUSTINE SMITH,** Joint Professors of Anatomy, Surgery, and Physiology.

**DAVID HOSACK, M. D.** Professor of the Theory and Practice of Physic and Clinical Medicine.

**WILLIAM JAMES MAC NEVEN, M. D.** Professor of Chemistry.

**JOHN R. B. RODGERS, M. D.** Professor of Obstetrics, and the Diseases of Women and Children.

**EDWARD MILLER, M. D.** Professor of Therapeutics, and Clinical Medicine.

**WILLIAM HAMERSLEY, M. D.** Professor of the Institutes of Medicine.

**SAMUEL L. MITCHILL, M. D.** Professor of Natural History.

**JAMES S. STRINGHAM, M. D.** Professor of Medical Jurisprudence.

**ARCHIBALD BRUCE, M. D.** Professor of Mineralogy and Pharmacy.

**JOHN D. JAQUES,** Treasurer.

**JOHN W. FRANCIS,** Register.

The Elgin botanic garden, in the vicinity of this city, having been purchased by the state of New-York, for the purpose of promoting medical science, and being placed at the disposal of the Regents of the University, that board has accordingly directed the trustees of the College of Physicians and Surgeons to take charge of the institution, to preserve and improve the same ; and that it be by them devoted to the purposes contemplated by the legislature. By this arrangement the botanic garden now constitutes an important appendix to the medical school of this city, and will be a valuable source of instruction to the pupils who may resort to New-York for the purposes of medical education.

*Abernethy's Surgical Writings.*

It is with pleasure we announce the republication of the first and second parts of the new and augmented edition of "Surgical Observations," by John Abernethy, Esq. F. R. S. of London. We have long wished to see the productions of this distinguished anatomist and surgeon, in the possession of every medical reader, as we consider them deserving of the greatest commendation, both on account of the many original and interesting facts which they contain, and the important practical conclusions which the author has deduced from them. We trust, that when the other parts of the work (which the author is now publishing in London,) shall have reached this country, they will be speedily added to the present American copy.

*Officers of the Medical Society of the State of New-York.*

WILLIAM WILSON, of Columbia, President.

WESTEL WILLOUGHBY, of Herkimer, Vice President.

BENJAMIN R. BEVIER, of Ulster, Secretary.

ASA B. SIZER, of Madison, Treasurer.

JOHN R. B. RODGERS, of New-York,

WILLIAM M'CLELLAND, of Albany,

ELI BURRITT, of Rensselaer,

JESSE SHEPHARD, of Schoharie,

WILLIAM PATRICK, jun. of Saratoga,

Censors.

*Committee of Correspondence.*

WILLIAM WILSON,

ASA B. SIZER,

JOHN R. B. RODGERS,

ELI BURRITT,

JOHN ELY,

HENRY SHERWOOD,

JESSE SHEPHARD.

At the late anniversary meeting of the Medical Society of the state of New-York, a prize medal of the value of fifty dollars was adjudged to the dissertation of Doctor JOHN STEARNS, of Albany, on the geology, mineralogy, and medical history of the county of Saratoga.

*Observations on the Weather of the City of New-York, for the months of January, February, and March, 1811.*

JANUARY.

The weather for the first two days of January, was remarkably clear and agreeable, and the thermometer stood at 3 P. M. at 26 degrees. On the evening of the third it commenced snowing, which continued through the fourth, when a small quantity of rain fell. From the 5th to the 16th, the weather was for the most part foggy in the morning, and either overcast or cloudy during the remainder of the day. On the 16th, a small quantity of snow fell, which was succeeded by rain; thermometer stood at 7 A. M. at 26, at 3 P. M. at 38, and at 7 P. M. at 35. On the night of the 18th, the mercury stood at 14 degrees. The remaining days of the month were generally clear and cold; wind chiefly from the N. W.

FEBRUARY.

On the 1st of February, there fell about 4 inches of snow; and on the 4th, about 6 inches more, which was followed by rain and a strong wind from N. W. On the 7th and 8th, we again had more snow, and also on the 12th, during which day, the mercury stood at or about the freezing point. On the 17th and 18th days, we had another fall of snow; this was succeeded by much colder weather, which gradually increased, and became considerably more severe than any we had experienced during the winter. On the 20th, the thermometer stood at 7 A. M. at 8, at 3 P. M. at 23, and at 7 P. M. at 21. On the 23d, at sunrise, it stood at 6 degrees. The weather for the remaining days of the month, became more temperate and agreeable. On the 26th, however, we again had some rain, accompanied with a wind from the S. W.



## MARCH.

The weather for the first five days of the month was clear, pleasant, and of a moderate temperature; wind chiefly from the westward. On the 6th, we had some snow, after which it became still milder; and on the 12th day, the thermometer stood at 7 A. M. at 39, at 3 P. M. at 55, and at 7 P. M. at 50, wind generally from the s. w. During the eight following days, there was very little variation in the temperature of the weather, it being for the most part clear and very mild, with the wind southerly. On the 21st and 22d, the thermometer stood as high as 67 at 3 o'clock in the shade. On the 24th fell a small quantity of rain; it again became pleasant, and continued so until the 30th, on which day, and on the 31st, we had more rain. The weather during the whole of this month, was extremely pleasant, and of an unusually uniform and mild temperature.

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*Observations on the Diseases of the City of New-York, during the months of January, February and March, 1811.*

Although we do not usually meet with intermittent and bilious remittent fevers during the winter season, some cases of those diseases have fallen under our notice during the last three months. Those who advocate the domestic origin of yellow fever, and consider it to be the same disease with the bilious remittent of this country, and that the latter is but a milder grade of the former, must find themselves at a loss to reconcile the continuance of the bilious remittent throughout the winter months, with the sudden extinction of yellow fever upon the first appearance of frost; a fact uniformly remarked whenever this last disease has prevailed in our cities.

These contradictions cannot be reconciled but by considering them as two totally distinct forms of disease.

The most prevalent complaints of the months of January, February and March, have been of an inflammatory sort, the effects of cold. Of these the most conspicuous have been *catarrh*, *croup*, *pneumonia*, and *rheumatism*. The approach of spring also brought with it those complaints which arise from, or are connected with, a plethoric state of the system, viz. *apoplexy*, *palsy*, *hæmorrhoids* and *erysipelas*. The *influenza*, *whooping-cough*, and a few cases of *scarlatina* have also been occasionally met with. Owing, too, to the neglect of the poor, in not availing themselves of the benefits of vaccination, the *natural small pox* has also become prevalent in our city; but happily, in no case has it appeared where the patient had been vaccinated. *Croup* we observe very rarely to be fatal where the physician is called early, and active means are employed to restore the suppressed excretions. The early exhibition of emetics in this disease cannot be too earnestly enjoined both upon the parent and practitioner. We have also had occasion to treat two cases of *apoplexy* in the manner pointed out in the last number of this work, viz. by *moderate* bloodletting, instead of the profuse evacuations usually prescribed in cases of this nature. Both cases terminated happily. Upon this subject, too, the editors take occasion to remark, that although they are opposed to the practice of copious bloodletting when the disease has actually taken place, they earnestly reprobate the neglect of this remedy in those premonitory symptoms of *apoplexy* which proceed from a plethoric state of the blood vessels. Where such *plethora* manifests itself in females after the natural cessa-

tion of the menses, by producing erisipelatous eruptions, vertigo, numbness of the extremities, or an oppressed state of the lungs indicating asthma, bloodletting in a moderate degree, has been found of great service. To the neglect of this remedy doubtless many cases of apoplexy and palsy are to be ascribed, as well as hydrothorax, the effect of effusion from an over-loaded state of the blood vessels.

In the treatment of *dropsy*, the editors have also had occasion to remark the bad consequences of the present fashionable treatment of that disease by fox-glove and mercury. In the *forming state* of dropsy, before great debility has been induced, and in those cases where the disease has been the effect of a full habit of body and inflammatory action, those remedies are indicated, and frequently prescribed with benefit. But in the second stage, in which the practitioner is apt to continue the use of those medicines that had been found serviceable in the commencement of the disease, they are manifestly injurious, by the debility they occasion. In those cases, iron, and the vegetable tonics, have been directed with the most salutary effects. The use of mercury in *hydrocephalus* has also, in the opinion of the editors, been too indiscriminately employed, to the neglect of the lancet, blisters, and other remedies calculated to divert from the brain the excessive action of the blood-vessels, which, for the most part, constitutes that formidable disease. Some recent cases of the salutary effects of the last mentioned remedies in hydrocephalus, and frequent observation of the abuse of mercury in the same disease, have led to these remarks.



## RECENT AMERICAN PUBLICATIONS.

Statutes of Columbia College, as adopted by the board of trustees, November 6th, 1810. 8vo. New-York. T. & J. Swords.

Supplementary Charter of the College of Physicians and Surgeons, with other ordinances relative to that institution. By the Regents of the University. 8vo. New-York. C. S. Van Winkle.

An Account of Expeditions to the sources of the Mississippi, and the western parts of Louisiana, to the sources of the Arkansaw, Kans, La Platte and Pierre Juan; performed by order of the government of the United States, during the years 1805, 1806 and 1807. And a Tour through the Interior Parts of New Spain, when conducted through these provinces by order of the Captain General, 1807. By Major Z. M. Pike. Illustrated with maps and charts. 8vo. Philadelphia. Conrad & Co.

Hortus Elginensis: or a Catalogue of Plants, Indigenous and Exotic, cultivated in the Elgin Botanic Garden, in the vicinity of New-York. Established in 1801, by David Hosack, M. D. F. L. S. Professor of Botany and Materia Medica in Columbia College, member of the American Philosophical Society, &c. Second edition, enlarged. 8vo. New-York. T. & J. Swords.

A Statement of Facts, relative to the establishment and progress of the Elgin Botanic Garden, and the subsequent disposal of the same to the state of New-York. By David Hosack, M. D. Professor of Botany and Materia Medica in Columbia College. 8vo. New-York. C. S. Van Winkle.

An Epitome of Experimental Chemistry, &c. By William Henry, M. D. &c. With Notes on Various Subjects. By B. Silliman, Esq. Professor of Chemistry. 8vo. New-Haven. Cooke.

Annual Discourse delivered before the Pennsylvania Academy of the Fine Arts, on the 13th of November, 1810. By Joseph Hopkinson, Esq. 8vo. Philadelphia. Inskeep and Bradford.

Eclectic Repertory and Analytical Review, Medical and Philosophical, Nos. 1 and 2. Philadelphia. E. Earle.

Observations on the Diseases of the Army, by Sir John Pringle; with Notes, by B. Rush, M. D. F. A. P. S. &c. 8vo. Philadelphia.

Torpedo War and Submarine Explosions. By R. Fulton, Esq. Fellow of the American Philosophical Society, and of the United States Military Philosophical Society. 4to. New-York. Wm. Elliott.

A Letter on Chimney Fire Places, addressed to R. R. Livingston, L. L. D. President of the Society for the promotion of Useful Arts. By Benjamin De Witt, M. D. Professor of Chemistry in the University of the State of New-York. 8vo. Albany. S. Southwick.

Observations on Combustion and Acidification; with a new theory of those processes, founded on the conjunction of the phlogistic and antiphlogistic doctrines. By John Redman Coxe, M. D. Professor of Chemistry in the University of Pennsylvania. 8vo. Philadelphia.

The Modern Practice of Physic, exhibiting the character, causes, symptoms, prognosis, morbid appearances, and improved method of treating the diseases of all climates. By R. Thomas, M. D. with an Appendix by Edward Miller, M. D. Professor of the Practice of

Physic and Clinical Medicine in the University of New-York. 8vo. New-York. Collins and Perkins

A New Universal and Pronouncing Dictionary of the French and English Languages, containing above fifty thousand terms and names not to be found in the Dictionaries of Boyer, Perry, Nugent, Focquet, or any other lexicographer. To which is added, a vast fund of other information, equally beneficial and instructive, never before published in any work of this kind. For the benefit of all who may consider a knowledge of either language an acquisition in their respective situations in life. By N. G. Dufief, author of *Nature Displayed* in her mode of teaching language to man, applied to the French language. Large octavo, 3 vols. Philadelphia, by Palmer, for the booksellers.

Memoirs of the Philadelphia Society, for promoting Agriculture, containing communications on various subjects, in husbandry and rural affairs; to which is added, at the request of the society, *Inquiries on Plaster of Paris*. 8vo. vol. II. Philadelphia. Johnson and Warner.

*Nature Displayed* in her mode of Teaching Language to Man; or a new and infallible method of acquiring a language in the shortest time possible, deduced from the Analysis of the Human Mind, and consequently suited to every capacity, adapted to the French. By N. G. Dufief, third edition highly improved and much enlarged. 8vo. 2 vols. Philadelphia, for the booksellers.

Professor Rush's Syllabus; together with sixteen introductory Lectures to courses of Lectures upon the Institutes and Practice of Medicine. To which are added, two Lectures upon the Pleasures of the Senses and of the Mind, with an inquiry into their proximate cause. 8vo. Philadelphia. Bradford and Inskeep.

Collections for an Essay towards the *Materia Medica* of the United States. By Benjamin Smith Barton, M. D. & P. &c. 8vo. Philadelphia. E. Earle and Co.

The American Medical and Philosophical Register, or Annals of Medicine, Natural History, Agriculture, and the Arts. January, 1811. No 3. Conducted by a Society of Gentlemen. 8vo. New-York. Ezra Sargeant.

*Inchiquin*: the Jesuits Letters during a late residence in the United States of America. 8vo. New-York. M'Dermut.

American Ornithology, or Natural History of the Birds of the United States: illustrated with plates engraved and coloured from original drawings taken from nature. By Alexander Wilson. Imperial 4to. vol. 3d. Philadelphia. Bradford and Inskeep.

#### PROPOSED AMERICAN PUBLICATIONS.

*By B. and T. Kite, Philadelphia.* An Introduction to the Theory and Practice of Midwifery, by Thomas Denman, M. D. licentiate in Midwifery of the College of Physicians, and honorary member of the Royal Medical Society at Edinburgh. Taken from the last London edition, with the author's latest improvements. To which will be added, his Treatise on the Rupture of the Uterus, Mania Lactea, &c. the whole accompanied with Notes, by Thomas C. James, M. D. Professor of Midwifery in the University of Pennsylvania.

*By W. Duane, Philadelphia.* An Essay on the Diseases incident to Europeans in Hot Climates. By James Lind, M. D. with Notes.

*By T. Dobson, Philadelphia.* A System of Anatomy. By Casper Wistar, M. D. Professor of Anatomy in the University of Pennsylvania, Fellow of the American Philosophical Society, &c.

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*Botanical Lectures.*

Dr. D. Hosack will commence his annual summer course of LECTURES ON BOTANY on the second Monday in May next.

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**TO CORRESPONDENTS.**

An Analytical Review of the valuable productions of Monsieur Dufief, of Philadelphia, the 3d edition of Nature Displayed, and the New French and English Dictionary, just published, are necessarily postponed.

Some Observations on Croup, and an interesting communication on the same subject, by Professor Mitchill, are also unavoidably deferred to our next number.

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Future Communications for the American Medical and Philosophical Register, are requested to be addressed, post paid, to Dr. DAVID Hosack, New-York.



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